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High-Octane IT

How Mobil Is Getting
More Mileage
Out of Its Systems

PAGE 62

Global Information
Manager Ellen McCoy

PLUS

Is Your Web
An Internal
Battleground?

PAGE 74

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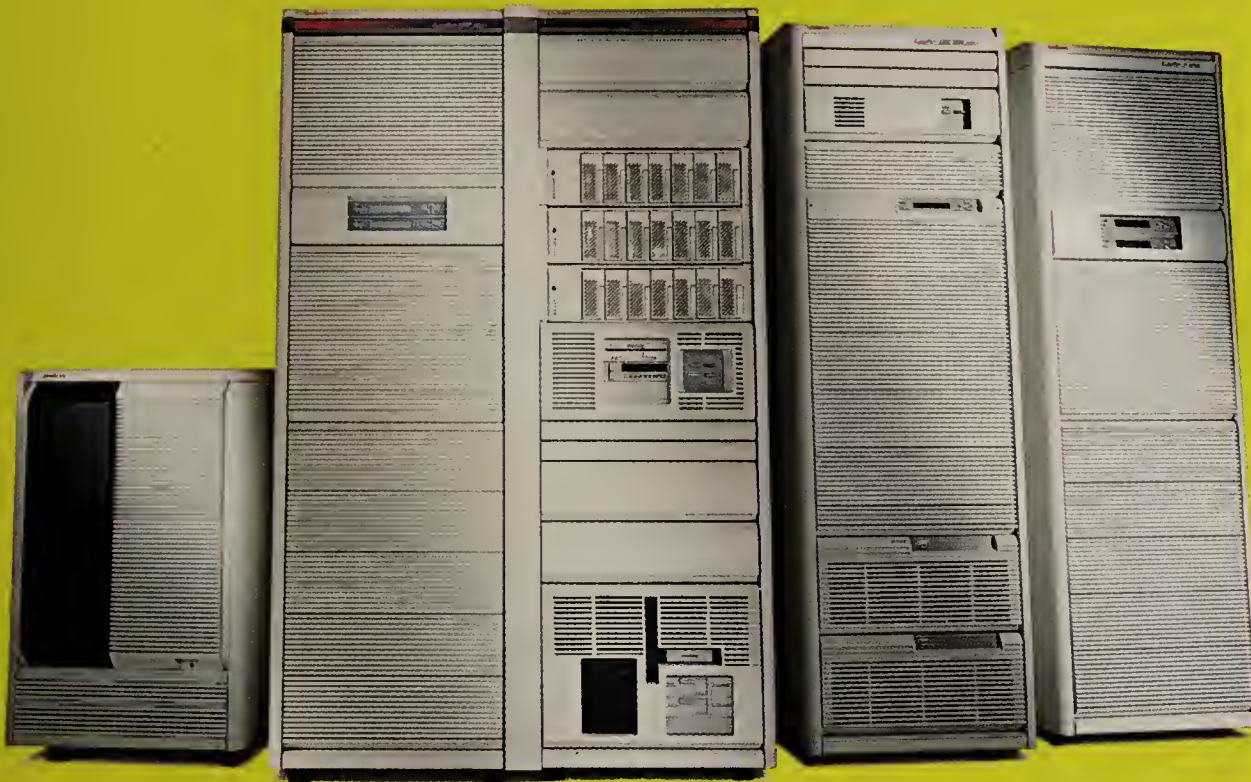
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Cover photo by Katherine Lambert

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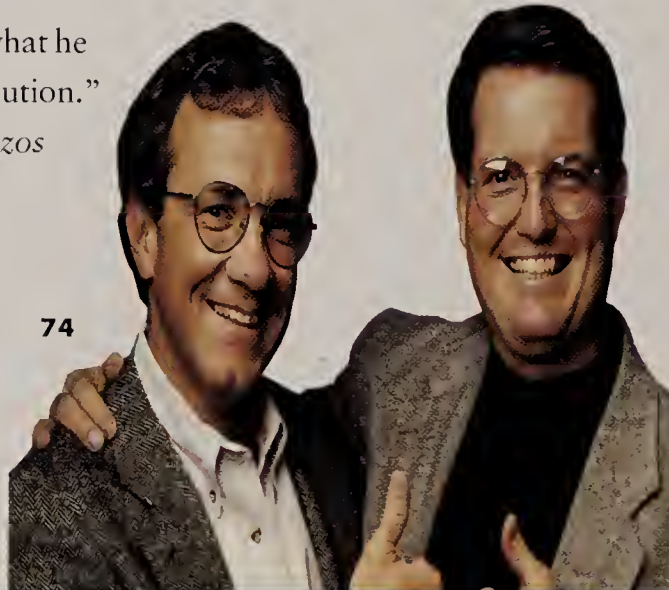
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Andrew Anker,
CEO, HotWired, Inc.

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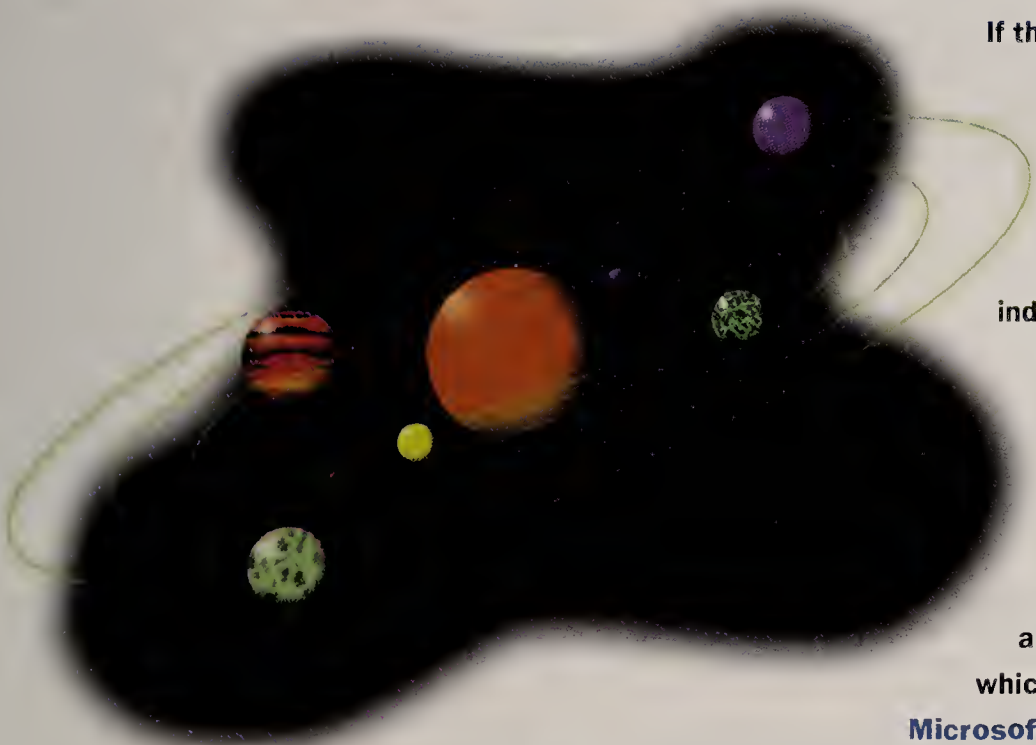
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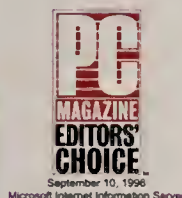
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someone says "take me to your leader.")*



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Front Row: Scott "Slapshot" Smith, Joyce "Long Ball" Deuel, Cindy "Bicycle Kick" Edwards,
Baily "Hang Time" Miller, Coach Bill Shea.

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† Sales for fiscal year 1996, according to *Federal Computer Week*, Government Technology Group.

**Source: Dataquest, November 1996



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InBox

LETTER FROM THE EDITOR, READER FEEDBACK AND HOW TO REACH US

"Fifty percent of CEOs and other senior executives say that technology decisions are an integral part of the strategic decision process."

—A.T. Kearney Inc. study of senior executives in the Global 1000

A recent study by management consulting firm A.T. Kearney Inc. examined senior executives' attitudes toward the role of technology in their core businesses. "The digital economy is here," says Doug Aldrich, vice president in Kearney's Dallas office. Many developments have brought the business economy to this point: networking, voice/data integration, mobile (and home) computing, the Web.



In terms of the global economy, "there is a tremendous push for new customers, new markets, etc.," Aldrich says, and to a large extent, information technology is what makes it possible to seize these new opportunities. Increasingly, he says, "IT drives business strategy, forcing CEOs to become technology-literate."

According to the study and other indications, Aldrich says, "CEOs are getting into the game."

The paranoid among us might wonder this: If CEOs and other business executives are getting into the game, does that mean the CIO is headed for the bench? On the contrary, now more than ever, business leaders are looking for someone to provide counsel on IT issues. This advisor has to be "a thought leader in information asset management" as opposed to someone who is good at managing the people and resources of the traditional IS organization.

As we discussed in the last issue of *CIO*, there is little reason for any company to create and manage all of its own technology anymore. There are just too many people out there who can do it better. CIOs who struggle to hold onto their organizational fiefdoms will fall by the wayside. Those of you who understand your companies' core business and are interested in applying your intelligence to figure out how technology can make it more successful have a very bright future indeed.

Alki Lundberg
lundberg@cio.com

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TYPECASTING

I am writing in response to "Survival of the Fittest" [Nov. 1, 1996], which I came across on your Web site (www.cio.com). In the article, you describe a simple test to identify how an organization views IT.

I know that this test is in no way scientific nor are the types [you mention] exhaustive, but I found your article very enlightening and hoped that identifying our IT culture would be the first step toward overcoming the issues you so eloquently describe. I sent it to my boss, the vice president of finance and a CPA. His response [see below] is frustrating because it is ambiguous. I think that we are a type C organization with type A aspirations. We are asked to take on big projects while maintaining the current infrastructure with little money and few people. This is exactly what you describe in your article. Perhaps my first task is to get the organization to see that we are type C and that comes with certain limitations:

Ken Becker

Director of Information Services
Lutheran Social Services of Wisconsin
and Upper Michigan Inc.
Milwaukee

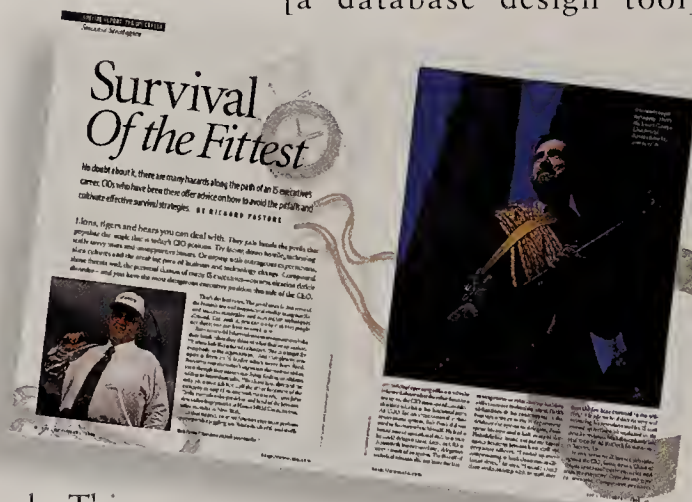
Mr. Becker's boss's response:

"We have been a part of each one—see my specific comments. Also note that [CIO's] options focus first on technology and not the customer; therefore, I

would choose D, all of the above, in one fashion or another."

Type A: The enterprise views technology as a strategic part of its plans. "You bet—managed care (one of our main applications) would not have happened without it. It is also a 'visible' part of our strategic plan."

Type B: The enterprise adopts technologies once they have proven useful. "Yes. This is how we got into DataEase [a database design tool]."



Unfortunately, the implementation was different from the method that brought success. No. We did not have a track record for the Internet. Permission to proceed was given without proof of use."

Type C: The enterprise is financially motivated. "Yes. Many opportunities have been implemented where there is a high return on IT investment. Large changes (i.e., the move to AS/400s) would probably be too expensive to cost justify."

Our response to Mr. Becker:

Thanks for the feedback. We are not surprised that a finance executive would claim your organization is all three types. Finance executives need to be loyal to their financial mandates regardless of what type of organization they are in, so they would always try to include C. The fact that the organization also has A aspirations is what creates the tensions. The only way we can think of to address this (and this is probably too simple) is to identify the projects that fall into the A category and try to convince the executives to give those projects A-type funding.

Try to persuade them to put aside the B and C tendencies when it comes to those A-type projects. If they want to be C-motivated for everything else, fine.

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Publisher's Note

"The Web has to be part of the whole mainstream business thinking process."

-Andy Greenawalt

*Vice President of Information Services for the Americas
Dell Computer Corp.*

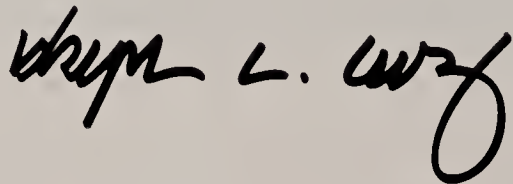
There's a new pair of archrivals to add to a long list that already includes such favorites as Godzilla and King Kong, Batman and the Joker, and the Red Sox and the Yankees. They wear no costumes and

boast no superpowers, yet today's CIOs and webmasters are quickly catching up to the likes of Superman and Lex Luthor with their new-found rivalry.

Or are they? Is it really that treacherous behind the conference room doors? Perhaps not. While CIOs and webmasters may take different approaches to business problems, have different backgrounds and possess different fields of expertise, they are essentially fighting for the same cause: achieving enterprisewide objectives and ROI.

Thus, the challenge is not deciding who wins and who loses but rather deciding the best way to combine forces so the entire company can emerge a winner.

Dell's vice president of IS, Andy Greenawalt, and its global online business development manager, Kenneth Hill, share the experience of working together in Senior Editor Carol Hildebrand's article "Web War" on Page 74. Facing such conflicts as risk versus opportunity and speed versus caution, these men worked together to overcome their differences and create solutions for the organization. The article takes us step by step through each conflict and solution and offers a positive example of effective collaboration between CIOs and webmasters.



P.S. Please be sure to join us May 18-21 at the next WebMaster Perspectives Conference, "A Tale of Two Webs: Making Your Intranet and the Internet Pay Off," in Miami. For more information, visit our Web site at www.cio.com or call us at 800 355-0246.

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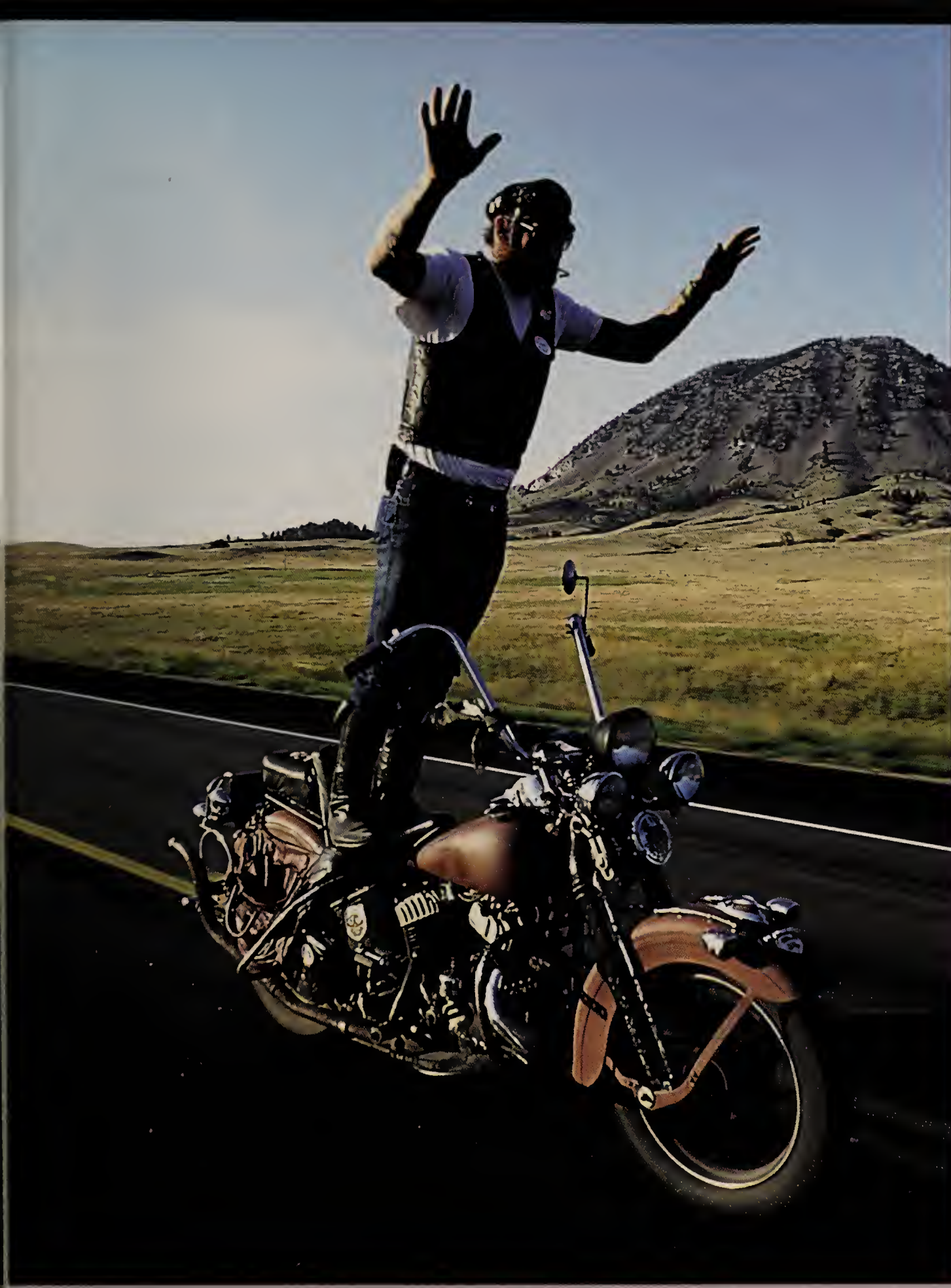
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Trendlines

NEWS, INSIGHT, HUMOR, REVIEWS

Edited by Cheryl Dahle

Mixed Signals

CAREER OUTLOOK It's the career equivalent of the ol' bait-and-switch. A recent case study on the BusinessTech Web site (businesstech.com/case/CIOCase/case/btcase.html) posits that the skills that win you a promotion to CIO are not necessarily those that will keep you in the position.

"The character traits and management style that earned promotion to the CIO position are not the same ones that enable that CIO to be successful once in the job, and these traits will therefore need more cultivating," writes Jerry Kanter, director of the Center for Information Management Studies at Babson College in Wellesley, Mass., in his case study "The Successful Chief Information Officer (CIO): You Gotta Know the Territory."

Rising through the ranks of IS requires skills such as outstanding analytical abilities and programming prowess, but the CIO job demands a whole different skill set. Kanter says the CIO's job can be divided into three areas of expertise: the business, the technology and the organization/people. But if CIOs can't manage the people and organizational stuff well, Kanter says, their expertise in the other two areas will be less effective. Unfortunately,



IT careerists aren't exactly known for their communication skills. "IT people are often individual achievers who like to apply facts and problem-solving skills to a challenge," says Kanter. "This is key on the way up [for example, as a developer for a new system], but

Better than a Horoscope

YEAR 2000 Finally, a 900 number you can legitimately put on your expense account. The Year 2000 Information Line Inc. of Atlanta has set up a hotline service to help IS executives get basic information and referrals to deal with the millennium problem in their organizations.

According to Year 2000 Information Line data, while almost 75 percent of IS execs think their companies will get slammed by the year 2000 problem, less than half of those have made addressing the problem a top priority, or

even allocated a budget line for it.

"My personal motivation for spreading the word about the year 2000 issue is that I don't want my children to live through a depression like in the 1930s," says Peter de Jager, who is a speaker on the topic of year 2000 awareness and an InfoLine contributor.

Topics covered on InfoLine include an overview of the impending crisis, vendor listings and tools, expert management advice and legal information. A companion Web site (www.y2k-info.com) also offers print-outs of key issues and electronic access to experts on the subject. The InfoLine number is 900 555-0101 (calls cost \$2.99 per minute). ■



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Trendlines

later on, a CIO needs to know more about softer skills."

That need is exacerbated by the many structural and organizational changes underway in companies today. Organizations are flatter these days, and computing power has become much less centralized. As a result, IS executives find themselves answering the traditional roar of their bosses and the executive staff as well as a chorus of different voices: a new crescendo of squalls from operating unit managers, who now have a strong say in many IT decisions. The result? CIOs must learn to manage both bosses and peers, according to the case study, and to do that, they must take a long, introspective look at both their management style and their personality type. "The first step is the realization that there is an issue," says Kanter, "and sometimes that's not as routine or automatic as you might think. I've worked with lot of CIOs who don't see the importance of the human side. They think it's all technology." Kanter recommends that IS executives refer to tests that evaluate personality traits, such as the Predictive Index (PI) and the Myers-Briggs Type Indicator, as a reality check. The PI, for example, measures characteristics according to four specific drives, defined as follows:

- **A DRIVE (DOMINANCE):** *results-oriented, attacks problems, strategic, authoritarian*
- **B DRIVE (GREGARIOUSNESS):** *persuasive, people-oriented, values acceptance*
- **C DRIVE (STABILITY):** *orderly, methodical*
- **D DRIVE (ACCURACY):** *process-oriented, interested in formal structure and precision*

The study also says that whereas the ideal CIO gets high marks in the dominance and gregarious categories, many real-life CIOs are far more apt to have personalities that favor stability and accuracy.

Kanter says CIOs can use the test results to make management style changes. For example, a CIO could hire IT managers who complement rather than echo his or her style.

In the end, it falls to the CIO to realize that a company is inevitably populated by humans, not machines. "Can you change?" asks Kanter. "I have a feeling you can if the motivation and rewards are there." —Carol Hildebrand

Looming on the Horizon

NEW TECHNOLOGY Warehouse clothing stores that sell "irregular" clothes—the ones with stains, oddly shaped sleeves and haphazard stitching—could soon be short on inventory if a new online fabric inspection system takes hold in the industry.

The system, developed by researchers at the Georgia Institute of Technology, uses advanced vision technology combined with neural networks and fuzzy logic to root out those imperfections in the

fabric, cutting inspection costs and reducing the amount of low-quality fabric that's produced.

Tested last year at textile manufacturer Johnston Industries' Phenix City, Ala. plant, the system uses special lighting and a set of high-speed cameras to scan fabric as it winds onto a take-up roll after weaving.

A computer then analyzes the information provided by the vision system, using techniques that identify abnormal patterns and determine whether they should be considered defects, thus allowing the manufacturer to fix the problem right away and prevent any further defects.

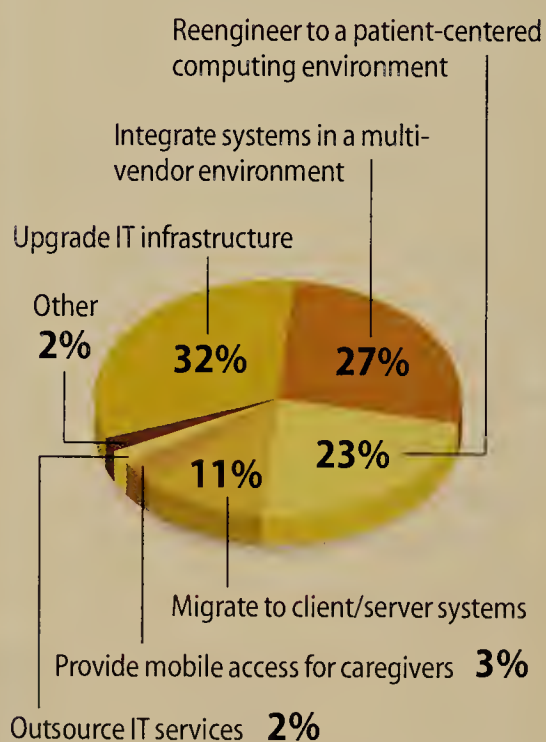
"We have developed new and innovative software algorithms for the detection and classification of defects," explains George Vachtsevanos, a professor at Georgia Tech's School of Electrical and Computer Engineering. "We extract signatures from the images that are characteristic of the type of defect that might be present. We use a new wavelet/neural network construct for this signature extraction, along with fuzzy logic decision support systems. The software integrates learning and optimization tools that avoid false alarms and improve the recognition accuracy."

The system, which could save textile manufacturers as much as a million dollars in inspection costs each year, is slated to go commercial. ■

Health Cares

Companies in the health-care industry rank patient-focused IT systems as a top concern for the future

I.T. PRIORITIES



SOURCE: 1996 HIMSS/HEWLETT-PACKARD LEADERSHIP SURVEY

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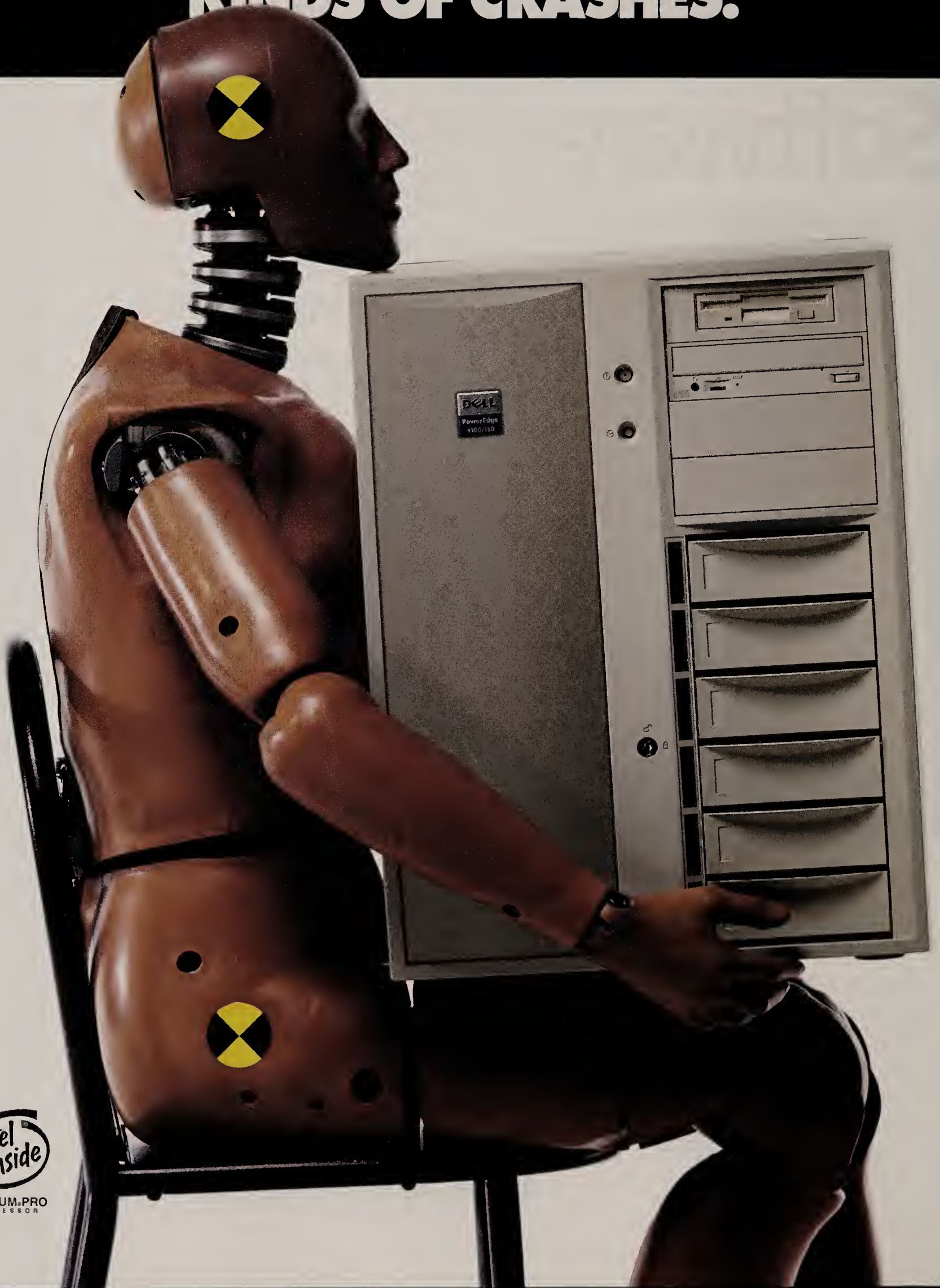
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Trendlines

Findings Network Computing

Scrap Your PCs and Save?

Well, it seems that the hypemongers

aren't always full of baloney: You really can save money by using network computers instead of a traditional PC environment. The question is, how much?

While the NC boosters at companies such as Sun and Oracle like to predict cost savings of 50 percent and up, a recent study by Gartner Group Inc. estimates considerably smaller savings.

The report compares the total cost of ownership (TCO) of a networked PC running Windows 95 (\$9,784 annually) with three different flavors of network computers. The first, which Gartner calls the Network Computer-Client (NC-C) option, is based on the version of NC that Oracle, Sun and IBM favor: a memory-free terminal that pulls everything it needs off the network using Java applets. Gartner defines it as "a client device or end-station that executes tasks that have been acquired from somewhere on the network." Gartner estimates that the NC-C can save a company 39 percent over a traditional PC environment.

Gartner Group calls the second model the Network Computer-Server (NC-S). The concept has been around for a few years and is the brainchild of Citrix Systems Inc. Basically, the NC in this scenario is "an intelligent display device that accesses and executes Windows applications on a local server via the ICA protocol," according to the Gartner report. Gartner estimates that this approach can save 31 percent.

Finally, there's what Gartner calls the Network PC (Net-PC). "This class of device has been proposed by both Intel and Microsoft and essentially is an extension of the PC as we know it today," according to the report. It will have no floppy or CD drives but will feature a large hard drive for loading applications off the network. That model is estimated to save 26 percent over a traditional PC environment.

But David Cappuccio, vice president and research area director of network technologies at Gartner, says company IT planners should not make hasty plans to light a grand PC bonfire. First of all, with the exception of the Citrix solution, the stuff isn't here yet, and it probably won't be for another year. Second, there's another option. The TCO study was based on what Cappuccio calls a rather loosely managed PC environment. "By employing currently available business management skills, the total cost of ownership of a PC environment can be improved by 25 percent to 30 percent," he says. In other words, CIOs can save the same amount of dough if they just manage their current technology more efficiently.

—Carol Hildebrand



Your Tax Dollars at work

PLAYING GAMES Word travels fast, even without a Web page devoted to "Ways to Slack Off on Your Government Job." It seems that thousands of U.S. government employees have logged more than 5,000 hours in aggregate over one three-month period on the Jumbo Web site—a page that offers more than 90,000 shareware and freeware computer applications and games, according to the webmaster of Jumbo's site, Tony Heinz.

Exactly why those government employees visited the site, we're not sure; let's just say that one popular game offered on the Jumbo site, Quake, a 3-D war game that pits the player (ironically, a government-appointed warrior) against a legion of world-conquering bad guys, probably wasn't downloaded hundreds of times per day for national security reasons. Another government-worker fave is a multimedia scene of Homer Simpson belching, according to Jumbo's site statistics.

ILLUSTRATION BY CHRIS LENSCH

"Rapid implementation and the functionality we needed—Oracle Applications were the obvious choice."

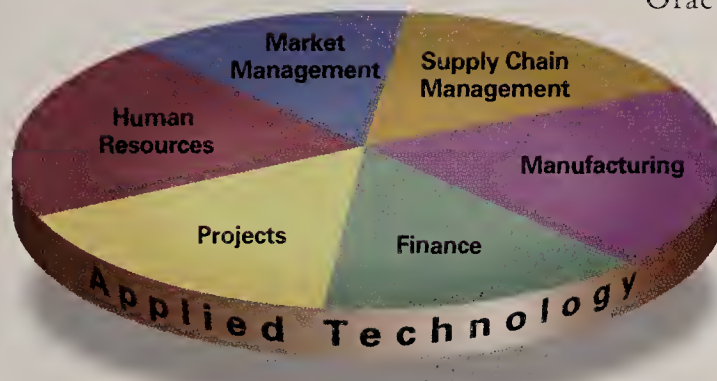
Alex Gray, Vice President of Corporate Operations

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To their credit, civil servants who visited the site also downloaded a significant number of free business-related applications and utilities, thus saving taxpayers some serious money.

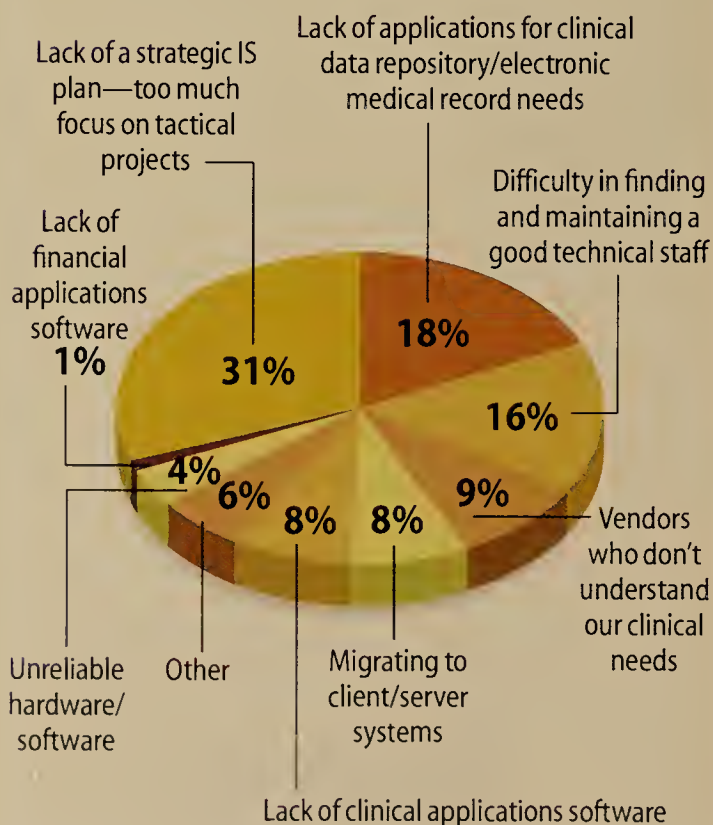
The Ames Research Center, based in Mountain View, Calif., was Jumbo's largest government user, logging more than 950 hours and hitting more than 25,000 pages between August and October last year. The Executive Office of the President tallied only 4.8 hours on the site—staffers were probably too busy, what with the election and all.

Not far behind the White House was the U.S. Postal Service, whose employees logged more than 112 hours during that time. So although rain, sleet and snow are no problem for mail carriers, when the surf's up, you might expect that snail mail to crawl a little more slowly. ■

What Ails You?

Health-care companies rank lack of IT strategy as one of their worst frustrations

I.T. PROBLEMS



SOURCE: 1996 HIMSS/HEWLETT-PACKARD LEADERSHIP SURVEY
TOTAL EXCEEDS 100 PERCENT DUE TO ROUNDING

Experimentation Without Taxation

CUTTING COSTS So you know innovative IT can improve your company's bottom line and processes, but did you know it can also subtract millions from your tax bill?

Companies that develop their own applications can be eligible for a tax credit under a tax code provision for business research that

Congress established in the 1980s. Although companies usually interpret the incentive narrowly to apply to areas such as product development, huge tax credits may also be available for new research that involves lines of code instead of lab coats and test tubes, says Tony Mondoro, partner in Ernst & Young LLP's national tax group and director of its research credit practice in Iselin, N.J.

For a company to qualify for the tax credit, its project has to involve experimentation, uncertainty about what the final application will be and some element of economic risk, Mondoro says. "There can't be a cookbook out there [already] that says, 'If you want to build an inventory management system, do A, B and C and you're done,'" he says. The software system also has to save the company time and money, and project costs must represent an increase in the amount the company spends on research.

Once a project qualifies, items such as salaries for internal IS people and outside consultants can be counted toward the credit.

To prove the project's uncertainty, a company has to submit logs from programmers and minutes from meetings. (The IRS prefers actual working paper trails rather than an after-the-fact summary, Mondoro says.)

The provision expires at the end of next month, though there is a considerable chance it will be renewed as it has been in the past, Mondoro says. In the meantime, he adds, companies can still claim back credit for up to three years.

"Ninety percent of what I'm doing right now is helping companies recover money they've spent in the past, and those are generally sizable refunds," Mondoro says. "You have three years you can file for, and some companies have agreements [with the IRS that allow them] to go back further."

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"The IT guys really look like stars," Mondoro says.
—Cheryl Dahle



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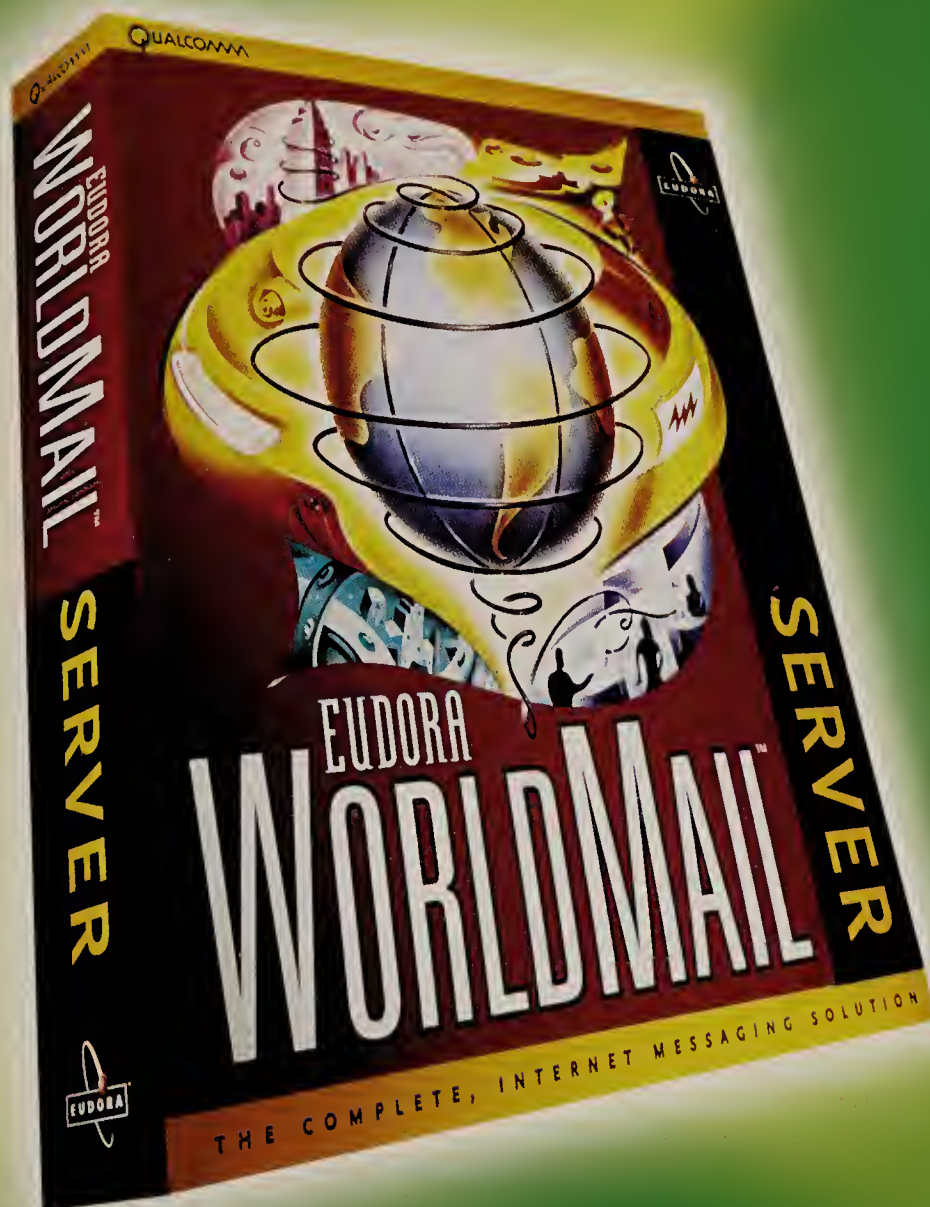
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Lump It and Like It

Fixed-price consulting can prevent project woes

AS PERHAPS THE WORLD'S FIRST project manager, Noah had a tough challenge on his hands, what with all the intangibles—bad weather, a mercurial boss—and the need to manage an extremely diverse set of stakeholders. Yet for all the difficulties, 40 days and nights was nothing compared to a typical enterprise resource planning (ERP) software installation.

Try the equivalent of 14,000 days—that's how much time Andersen Consulting said it would need to install SAP's powerful, complex R/3 software at Bay Networks Inc. Andersen could make such a prediction because, unlike Noah, it had done that sort of thing before.

Maynard Webb, vice president and CIO of Bay Networks, a computer

networking hardware company in Santa Clara, Calif., had done that sort of thing before too, which is why the 14,000-day prediction didn't come as a shock. Webb understood that consulting costs would be the biggest line item in his budget—in some ERP projects, they add up to 10 times the cost of the hardware and software combined.

Good consulting advice has become so important to the success of really big ERP projects that the fees consultants charge for those services are getting out of control, Webb says. And while the function of typical IT consultants has changed dramatically from the days when they basically came in, installed a mainframe computer and left, the way they charge companies for their services—by the hour—has not.

Getting paid by the hour (\$300 an

hour minimum for good ERP people these days) doesn't create much incentive for consultants to watch their billing waistline, according to Webb. It also runs counter to the two most important goals in managing ERP projects: controlling the scope and the schedule. Let either of those slide and the project is doomed. How, asks Webb, do you keep a lid on ERP project expenditures when the consultants have different incentives from your own staff? "When the system integrators are being paid on a time and materials basis, they don't push back if you want to add things to the project," he says. "Why should they? It means more money for them."

That conflict led Webb to ban the à la carte pricing system entirely when he put the Bay Networks SAP proposal out to bid in March of 1995—it would be *prix fixe* or nothing. Webb wanted no more of the constant price bickering that had plagued some of his earlier consultant-heavy projects at other companies. "I got tired of constantly checking on who was working on what and whether they were worth their hourly rate," says Webb. "It got to the point where I was spending almost as much time doing time and materials sheets as I was solving real business problems."

More important, Webb wanted his consultants to be as motivated to finish the project on time and under budget as his own staff. Webb's demand that consultants share his risk is a growing trend in the ERP market, according to Karl E. Newkirk, partner in Andersen Consulting's Americas SAP Business Organization in Cleveland. "Clients are saying, 'If I'm going to bet the ranch like this, I want some insurance,'" he says.

That's what Webb was looking for in April of 1995 when Andersen bid on the job. Together, Webb and Kevin Reedy, an Andersen partner in the electronics and high-tech practice in Palo Alto, Calif., came up with a package deal in which Bay Networks would



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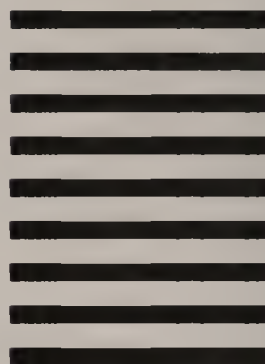
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Executive Counsel

pay Andersen the cash equivalent of 14,000 days' worth of consultants' time for the project in return for getting the R/3 system up and running by July 1996. The first 5,000 days' worth were spent planning the project and finding the right Bay Networks people for the team. Webb and Reedy also spent a lot of time preparing the top executives at Bay about the ERP options so that they understood exactly what they were getting into.

That left 9,000 days' worth—packed into five months—for Reedy to get his work done. Any more than that, and Andersen was paying for his people's time, not Bay Networks. "They were going to lose money if we slipped," says Webb. "They were focused on the same thing we were—getting it done." Bay Networks staff bonuses were tied to finishing the project on time and on budget. "The metrics were the same for them as they were for us," says Reedy. "Nobody talked about raising the days to 15,000."

To spice up the bets on the magic number, Reedy developed what he calls a "gainshare" strategy, which called for both sides to assume some cash risks. Reedy agreed that if the project was not completed on time with a level of quality that was acceptable to Bay Net-

works' board, Andersen would refund 10 percent of the package price to Bay. If, on the other hand, the project was completed ahead of schedule with a favorable grade from the board, Bay would write a check to Andersen for the same amount.

For Reedy to come away with the prize, his 14,000-day estimate had to be correct. That was a gamble in itself. Although the hardware and software costs are easy to predict, people are what make or break an ERP project. A lot depended on the real (rather than promised) support for the project from the top executives at Bay and the quality of Bay's project team staff. Perhaps most important was the balance of power in the project team: Would Bay try to control Reedy and his staff, or would the team share the decision making?

Reedy relied on Andersen's SAP "estimating model"—a big Excel database that measures 50 different project variables based on Andersen's collective ERP experience—to reduce uncertainty in the estimating process. More important, the estimating model became a handy way to manage scope creep during the course of the project. "We went through some tough times early on," says Webb. "Kevin

had a fight within Andersen to let him do the gainshare because we were being vague about the [project estimates]. At the beginning we didn't know how many reports [custom applications that sift SAP data into printed reports] we'd need."

Webb and Reedy did battle early and often over the Excel printouts. Each week Reedy would run the numbers, and if they added up to more than 14,000 days he would call a meeting with Webb and the team. "We originally planned to have 70 reports, and as we got into it the users came up with 120," says Reedy. The team negotiated with the users to get the number of reports down to 80, and Reedy automated a few applications that he'd planned to write and fed the numbers into the database until it spat out 14,000 again.

Though the deal seems to place a bigger burden on Reedy's shoulders than on Webb, he claims that he prefers the gainshare arrangement to a time-and-materials project. "The risks were more than compensated by having control over my staff," says Reedy. "When we're working on a time-and-materials basis the client has to approve all the resumes and the hourly rates of my people. When you're on a tight schedule that can be frustrating. On the Bay Networks project, I had the freedom to manage my staff and my costs any way I wanted to. When we were late in the game and I needed to bring in an expert to do something, I just did it. I didn't need to send his resume past five different people for their approval. Webb didn't care, because his price wasn't going to change, no matter whom I brought in."

After the system had been up and running for a quarter, Webb wrote a check in the low six figures to Andersen for beating the deadline and meeting the quality standards. But if Webb had run a credit check on Reedy's team, he would have discovered that the bonus money had already been spent. "I don't know if I really ended up with a 10 percent bonus," Reedy admits, "because I did go in myself and put in the extra time and brought in the high-priced experts to get the project done. It was more important to me to avoid the penalty." **CIO**

Senior Editor Christopher Koch can be reached at ckoch@cio.com.

Keep Your Checkbook Out

Consulting costs add heft to project price tags

DON'T UNDERESTIMATE THE real costs of installing client/server packaged applications in a big company, say the experts. The biggest cost is tapping the brains of consultants. In a recent survey of 40 Fortune 1000 senior IS executives, Forrester Research Inc. in Cambridge, Mass., found that 54 percent of respondents were spending more than \$5 million on sage advice alone, and 26 percent were spending more than \$10 million. Sobering numbers

that won't get any lower in the next few years, as companies continue to use client/server packaged applications like SAP's R/3 to drive business process reengineering (BPR). Change, it turns out, is not only difficult, but expensive.

Forrester estimates that in a typical SAP R/3 installation, more than 50 percent of the implementation budget is spent on BPR. "When the essence of the project is change, then companies must be ready for pain," says Karl E. Newkirk, partner in Andersen Consulting's Americas SAP Business Organization in Cleveland. "I think the idea of enterprisewide software solutions is here to stay and unfortunately, that means there's plenty of pain left to go."

—C. Koch

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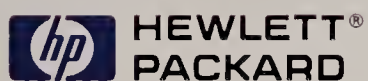
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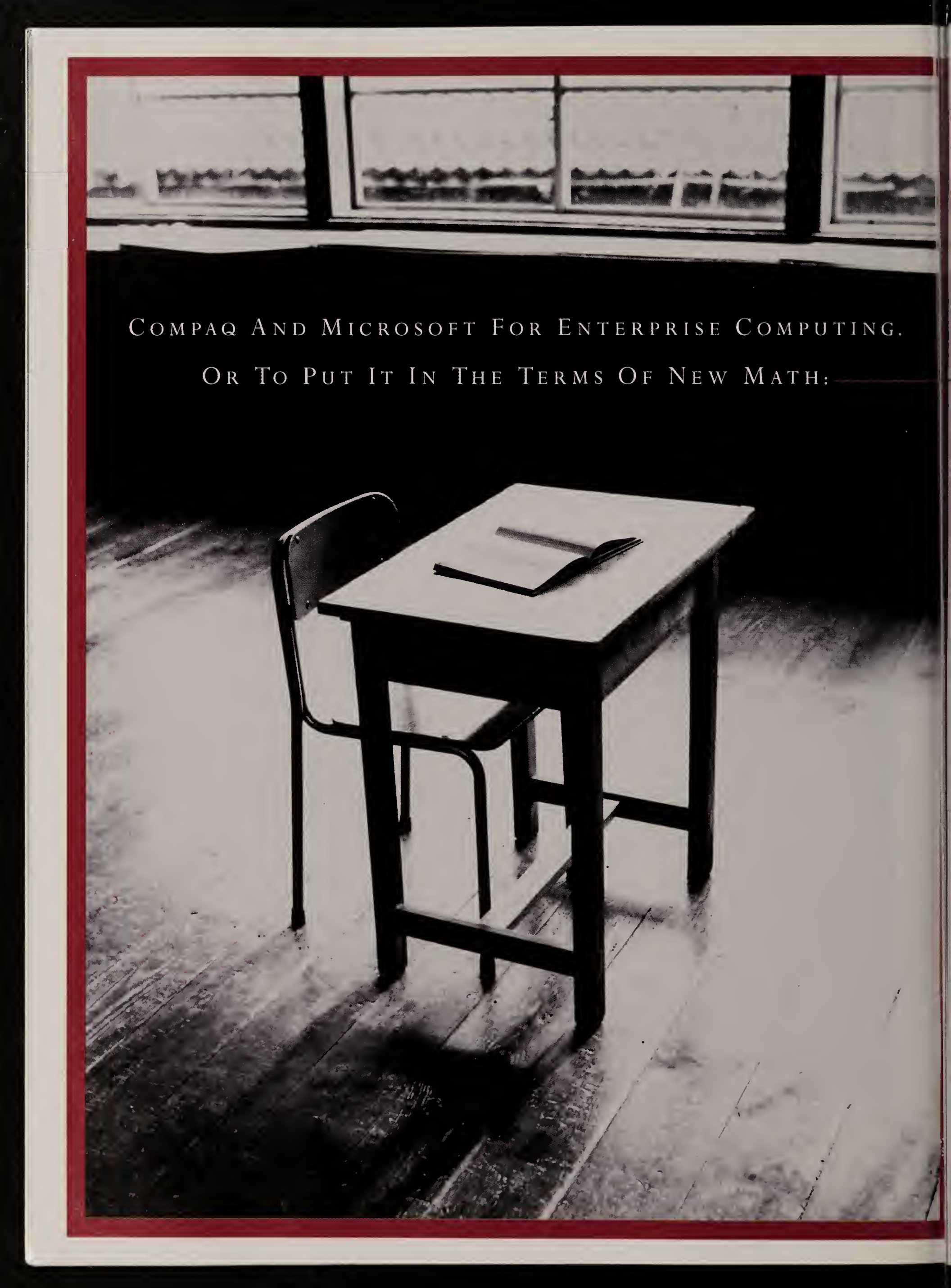
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Storming the Ivory Tower

Universities and companies need a crash course in how to work together better

BY TOM DAVENPORT

WORK FOR A UNIVERSITY. PART of my job is to help companies get more out of us and to help us get more out of them. Ideally, what we can offer companies is students who are well trained for the information technology environments of the future and research on how best to manage in those environments as well as in the present. What companies can offer us is positions for our students, research sites, an audience for our ideas and occasionally a few bucks.

But that potentially very fruitful relationship is only partially realized. We at universities have lost sight of our customers, and you in business haven't worked very effectively with the suppliers of your most important resource—people. Most students are trained for the past, not the present (and certainly not the future). Much IT-oriented research is neither comprehensible nor practical. Few IT managers work with universities to communicate their companies' needs, build long-term relationships or help shape the curriculum of the students they'll be interviewing for employment later. My point is not to assess fault but to try to point out where we have gone astray and how we can create a better partnership between universities and IT-oriented businesses.

How bad is the problem? In terms of student preparation, the situation is mediocre at best. Many business, MIS and computer science programs concentrate on computer languages. That isn't imaginative education, but

the approach might be acceptable if the languages taught were C++ or Java. Instead, some of the languages taught, such as Cobol and Pascal, verge on obsolete; others, like LISP (LISt Processing), always have appealed to academia but never caught on in business. Graduate business schools, if they teach much about IT at all, are always dealing with yesterday's problems. "Strategic information systems" may have disappeared from business practice, but they're still popular in MBA IT courses—as are expert systems and executive information systems. Reengineering isn't on the rise in business anymore, yet some schools are just now adding it to their course catalogs.

Universities may be the last bastion of the functional stovepipe. The average business-school student has no contact with the average engineering student (and their respective teachers have never met either). Within the business school, one can study marketing or finance or operations—but rarely how they all fit together. What academics

know about IT ought to be integrated with how to perform these other functions, but it's usually taught separately, leaving befuddled students to try to figure out how to use IT to design, make, sell and value good products. There are exceptions: Boston University has integrated IT, strategy and organizational behavior in the business school curriculum. At the University of Texas at Austin, we've created courses that integrate marketing, sales and IT. The University of California at Irvine has taken the ultimate step by integrating IT into all its core MBA courses.

Of course, just as universities are educating for the past, many of our customers are still hiring for the past. You would think that if we offered companies a student with both marketing and IT skills, they would be ecstatic.

But many HR departments are looking for either a business systems analyst or a marketing analyst and are thrown for a loop when confronted with a hybrid of the two. And I've heard CEOs of those same companies brag about the cross-functional natures of their organizations.

If the state of student education and hiring is mediocre, the state of IT-oriented research is downright dismal. Scarcely a manager today cares about decision support systems or group decision support, yet these topics appear regularly in academic journals. By the time academics get mobilized to address such hot topics as reengineering, they are becoming cold.

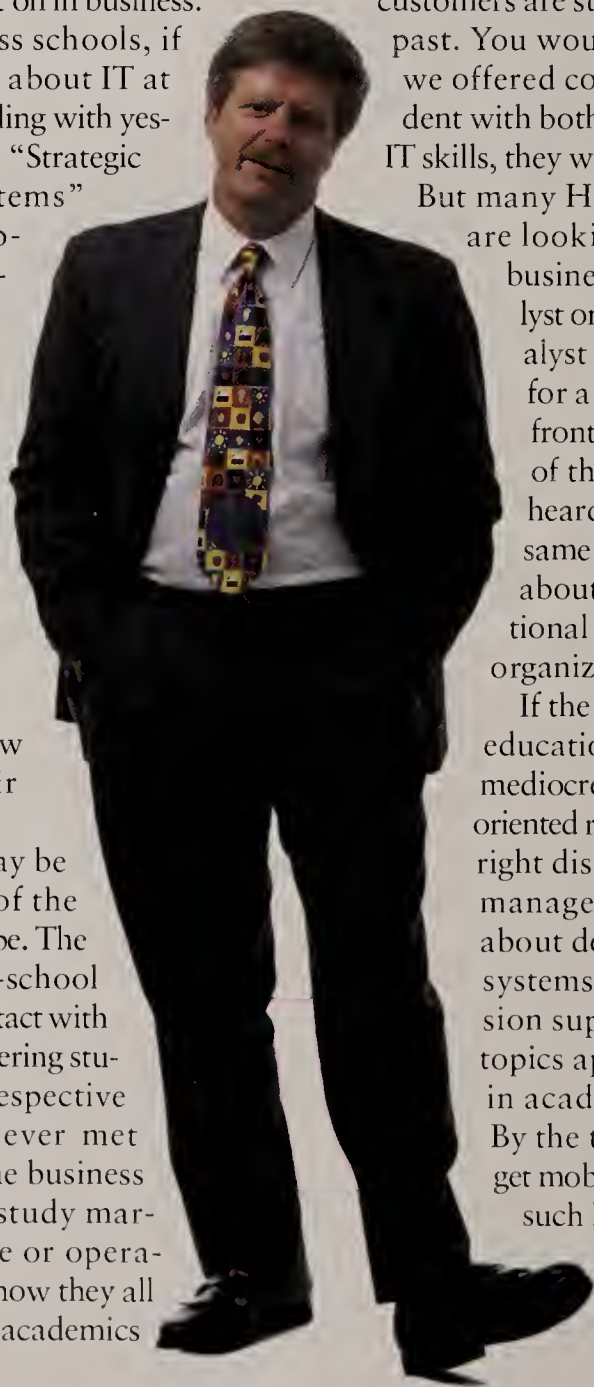


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Even on the critical large issues of our time—such as whether spending on IT improves productivity—research studies are so narrowly defined that the results are either conflicting or too specific to certain industries to prove useful to the business world as a whole. A potentially valuable resource lies fallow.

Why should you care? Since academics have largely dropped out of the race to invent concepts that help managers deal with IT in business, the field has been left mainly to consultants. As these firms get larger, they must sell larger consulting engagements, which usually means multimillion-dollar straight implementation gigs. Smaller projects costing, say, \$100,000 or less that may involve issues of IT strategy don't receive much attention from the Big Six.

If academics' ideas were practical, professors could provide companies with the necessary input to focus more attention on strategic topics that are too small (read: not lucrative enough) for

consultancies. It would also be helpful to counter the trendy and self-serving pronouncements from consulting firms with academic objectivity and empirical orientation.

Again, academics are not the only ones to blame. The best research is aimed at the "reflective practitioner," but that is an endangered species. Readable IT-oriented articles can be found in *Sloan Management Review*, for example, but how many IT managers read them? How did things go so wrong in the relationship between town and gown? I'd point to two factors at universities that have helped create this mess: the tenure system and the desire for academic respectability. Tenure doesn't necessarily ensure that faculty will lose touch with current practice; it does, however, guarantee that even those who ignore their customers or continue to teach obsolete concepts will never get fired. And in order to get tenure—which is awarded by other academics—professors have to do research that appeals

to their colleagues. Business school professors have been striving so hard to be rigorous—as defined by our peers in disciplines like economics, psychology and physics from whom we're trying to get respect—that most of us have lost all relevance to the business community. We would do better to emulate our colleagues in law and medical schools who have climbed down from the ivory tower to actually make contact with the real world. Many law professors regularly argue before the Supreme Court. And almost every physician affiliated with a medical school also has a clinical practice. Just as you call on an academic physician when you have a rare disease, you should be able to call on IT academics with exotic technology or information ailments.

For their part, companies have contributed to the sad state of affairs by ignoring some basic principles of supplier relationships. They treat students as a commodity—they're all pretty much

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Bruce Robertson, Director of Information Technology and Rodney Rogers, Vice President of Operations, Florida Crystals.

alike, so no special training is needed. Companies shop around for new talent among many university suppliers, thereby guaranteeing that no one will try hard to fulfill their special needs for educated employees. Companies pay headhunters to find the kind of employees they want but they seldom give anything to the universities that could train workers to have the desired skills. Most companies have learned by now that procuring good products and services requires close relationships with suppliers, but somehow they have not considered suppliers of people in that context.

What can you do? Like customers in other industries who require high performance from their suppliers, you business IT managers must rise up before universities and demand better. Pick a few colleges to work with on the basis of proximity or fit with your current needs. Select a couple of professors whose work you comprehend and admire, and hire them as your armchair consultants. Tell

those schools what's going on in your business and what types of people and skills you will need. Make sure the technologies the students are learning are the ones you will be using. Don't wait until

Don't wait until students have graduated before you start working with them

students have graduated before you start working with them—establish internships and on-site research projects and volunteer to tell classes about your organization and its issues. That way you'll get graduates whom you already know and who already know your organization. If the professors you contact aren't responsive, call on the president or the dean, who have a few means at their disposal to influence faculty behavior.

And cough up some money—it's sorely needed, and there is no better

way to influence the system. I'm not talking philanthropy but rather a subtle quid for your quo. Give money in exchange for courses and degree programs that fit your needs, research projects that address problems in your organization and consulting jobs from smart people who do not have to sell you more and more work to stock their company's food chain.

If people are your most important resource, then institutions of higher learning can be your most important resource provider. While universities are just as resistant to change as the rest of our society, economic realities ultimately will prevail. If you don't satisfy your customers, you die, and alternative sources will spring up. **CIO**

Thomas H. Davenport is a professor and director of the Information Management Program at the University of Texas at Austin. He welcomes reader comments at Tdav@notes.bus.utexas.edu.

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Numbing Your Rollout Pain

Systems reengineering doesn't have to be a sore point for users if you structure the rollout around their needs

BY BRITTA SCHATZ AND KAREN FINIGAN

EVERY BUSINESS AT ONE TIME OR another must overhaul technology critical to its success—a process that strikes fear in the hearts of managers and staff alike. The goal, of course, is to make the transition to new technology as painless as possible while keeping employee morale and productivity high.

We went through that difficult process at Phico Insurance Co. in 1996 when we embarked on a \$3 million project to modernize workers' compensation claims processing. Phico, based in Harrisburg, Pa., offers workers' comp and liability insurance and is

also a third-party administrator, providing compensation claims services for self-insured customers.

The task was particularly daunting because we were combining two systems that served an identical purpose: tracking workers' comp claims, reserves and payments. We used a Cobol-based application on an IBM Corp. AS/400 midrange system for the workers' comp insurance side, while claims services—third-party administration—ran on a PC system. Integrating the two systems onto one platform was a key goal for our new technology.

We also needed to reduce paper. Each workers' comp claim averages between 70 and 100 documents, and Phico receives about 100 new claims a day. On average, that amounts to 8,500 pieces of paper every day. Typically, two to three people handle each claim, but there was no way to simultaneously share the information without making duplicates and even more paper files. The new system would have to solve that problem by allowing electronic access to claims.

To meet those goals, we needed three new applications and hardware. We decided to replace the PC platform and run the new system on the AS/400, adding IBM workstations and an AS/400 front-end data entry and inquiry application. The other applications we implemented were IBM's ImagePlus imaging software and Lotus Notes. Like many companies, we began the implementation process full of apprehension: Employees were nervous about learning a new system, and managers were worried about morale, employee productivity and whether the results of our efforts would justify the expense.

Despite the challenges and apprehension, our overhaul was a success thanks to a phased-in rollout plan that began in summer 1995 and concluded in March 1996. The plan included five elements that proved pivotal to minimizing employee pain: technology demonstrations, a pilot team, frequent communication, a model office and a "SWAT" team.

Demonstrate the Technology

In order for people to feel comfortable with new technology, they must see, feel and touch it one step at a time. To avoid overwhelming employees, we demonstrated one application at a time to groups of five to 10 employees (a total of 150 were trained). First we showcased the workstation, then the image application process, next the groupware, and finally the front-end





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Expert Advice

data entry and inquiry system. Workers experienced the applications in the same order they would eventually use them in their jobs. We scheduled demonstrations on a flexible and fixed-time basis, allowing employees to drop in to sessions without disrupting their normal work schedules.

The demonstrations encouraged employee feedback on the system. Because the sessions were held early in each application's design and development cycle, the software could be altered as a result of the feedback. One suggestion we adopted based on such early feedback was a log-entry capability that lets users classify documents as confidential.

Establish a Pilot Team

We believed people would feel more comfortable with the new system if they could see their peers understanding and benefiting from it. So we established a pilot team, including a supervisor, two claims representatives and a medical

payment specialist. The team members worked at their desks—alongside their colleagues—as they learned, and eventually mastered, the system.

That approach allowed employees to observe firsthand how pilot team members overcame the normal pain and frustration associated with learning a new system and the amount of time required to do so. In addition, the team showed employees how their work lives would benefit as a result of the system.

Communicate Online and Offline

We knew that communicating frequently, with a consistent message, was critical to the success of the project, but we didn't want to add to meeting "overload." So we established communication on two levels. On one level, we exchanged information daily among our IS project managers via Lotus Notes. That essentially replaced the need for face-to-face meetings with the implementation teams. In fact, people were told not to

attend meetings unless they had something important to contribute; if they had only questions, they could ask and get answers online. Formal update sessions to review our progress rarely occurred more than once a month. As a result, we spent less time in meetings and more time devoted to productive work activity.

On the other level, we communicated with employees through a variety of other devices, including a monthly newsletter, e-mail, voice mail and unit meetings, during which we encouraged questions and feedback about the system. Every few weeks, we developed a new message or theme that we incorporated into each communication vehicle. The message helped ensure that we conveyed information about Lotus Notes, for example, in a clear, uniform fashion.

Open a Model Office

We also set up a model office that closely resembled our employees' own work-

Great moments in corporate



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E-MAIL, 1983

Technology seizes the day! Distribution and speed empowered corporate America. However, prioritization concerns were raised as important messages were buried.

place, only this one was equipped with all the new applications. The purpose of the model office was to create a no-risk, confidence-building learning environment—a comfort zone between the training class and the desk. To make simulations as “real” as possible, employees could test different scenarios using their own files. For example, claims reps could make log entries on their own claims in progress. The model office was staffed by two instructors and accommodated four users. Training sessions typically ran four to eight hours, depending on the topic being taught.

Deploy a SWAT Team

Once the new applications were in place, we found we needed a SWAT team to make everything work, at least initially. The team, made up of IS staff involved in the implementation, served two critical needs. First, it provided additional one-on-one support to roughly 150 employees using the fully operational

system. Second, it relieved the initial burden on our IS help desk, which recently had been outsourced. The SWAT team also provided information on and insight into the areas where employees tended to need the most assistance, which helped prepare the help desk to respond to future questions.

Accessibility and speed of response were critical. So we moved the five-member SWAT team into an office located among those of the employees they supported, decorating the area with morale-boosting banners and balloons. Employees could contact team members by stopping by the office. Often, however, team members didn't wait for users to summon them. They were out and about in the workspace, asking questions, testing the users' understanding of the system and offering assistance.

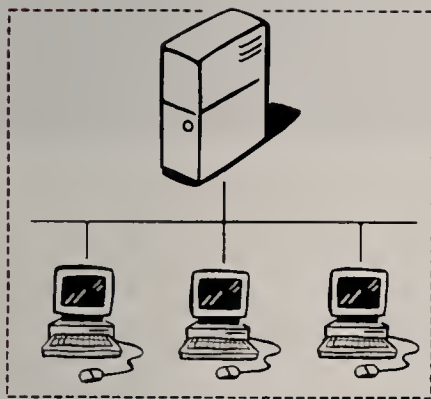
We made it clear, however, that this was not to be an ongoing service. The SWAT team operated three days a week for two weeks, at the end of which we

terminated the service. Thereafter, users were required to call the help desk. Limiting the availability of the SWAT team encouraged users to learn the system quickly by not letting them rely on the team as a crutch.

Now that the new workers' comp system is up and running, we plan to use what we've learned to roll out similar applications for liability claims processing in 1997. An incremental approach, a strong project plan and training developed from the user's point of view helped achieve successful systems reengineering at Phico. That strategy can be used and adapted by other businesses for a transition that is as painless, quick and productive as possible. **CIO**

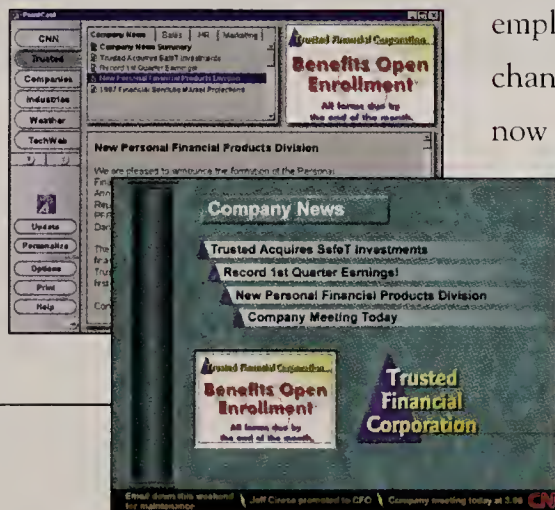
Britta Schatz is information systems manager at Phico. Karen Finigan works for IBM's Insurance Consulting Group. They can be reached at bhschatz@phico.com and kfinigan@vnet.ibm.com, respectively.

[communication] history.



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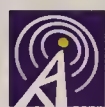


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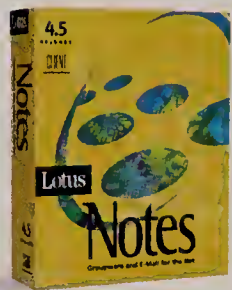
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Reader ROI

SETTING PRIORITIES AND communicating them to IS customers is important to a CIO's influence and success. This article will show you how to:

- ▶ Interview customers
- ▶ Assess needs
- ▶ Assign numerical values to project requests
- ▶ Structure decision-making committees

Brian Wegner created a spreadsheet model for Fortis Inc. that ranks projects in order of importance.

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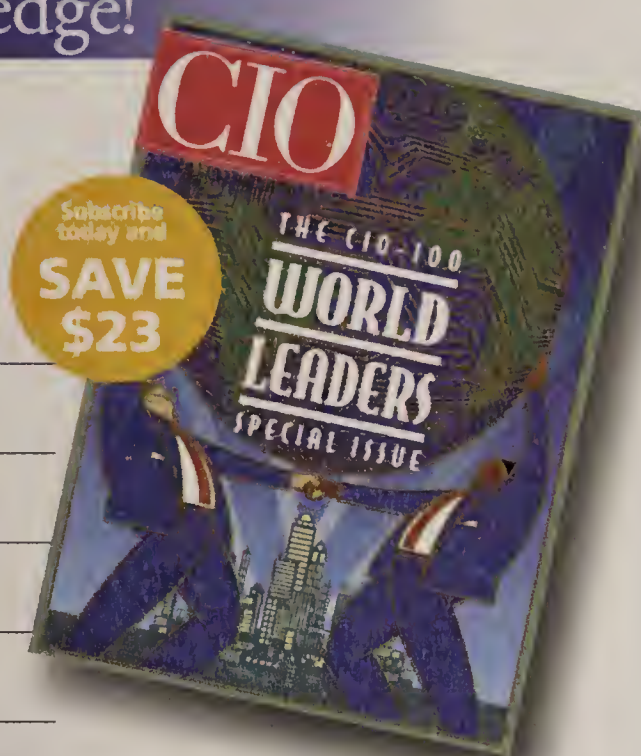
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Weighing the NOs and CONs

*Trying to figure
out how to set
priorities for
your company's
IT projects?
Start with a
spreadsheet.*

what if

you could create a spreadsheet that would help you weigh the value and urgency of a company IT project? Its leftmost column would list the projects your internal customers have asked for: human resources kiosks at six different locations, a system to track employee vacations and sick days, a customer order-entry and credit-approval system tied to inventory, and a hundred other items. The list could include some of your own ideas, like that upgrade for a major portion of the wide area network and a pilot in component-based development, among others.

Across the top of the spreadsheet, column headings might indicate system characteristics, considerations and constraints that come to mind when you think about the projects. As your company's top IT executive, you could fill the resulting cells with numbers indicating each project's strengths and weak-

BY MIRYAM WILLIAMSON

with data located behind a variety of different operating systems—UNIX, MVS. The key thing trying to do is pool that data from all sources and create value out of it. We researched the market a great deal to help with this new information.

Phil Orton, Director of Centralized Operations, Entergy Corporation

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First Things First

12 tips for setting priorities and making them stick

1. **DEVELOP** a formal, quantitative way to assess the business value of proposed projects.
2. **ENGAGE** customers in a dialogue about available resources and business needs throughout the year, not just at budget time.
3. **INTERVIEW** customers about their wants and needs; involve them in choosing among conflicting priorities.
4. **COMMUNICATE** frequently with customers about the IS department's achievements, current projects and short-term plans.
5. **REMEMBER** the human element. Take egos and the need for validation into account.
6. **WORK** with committees structured to minimize the influence of any one individual or department.
7. **VISIT** with the business units and ask, "How is the IS department doing?" Listen to the answers.
8. **COMMUNICATE** clearly how priorities are set so that people can anticipate project funding decisions.
9. **DEVELOP** a business case for every project, assessing its risks, business value and the cost of building or buying it.
10. **DEMONSTRATE** interest in the constraints under which business customers operate.
11. **STAY ON TOP** of changes in the regulatory and competitive environment in which the business operates.
12. **BE PREPARED** to show how a proposed project fits with business goals.

—M. Williamson

CIO PRIORITIES

nesses in relation to those parameters.

If you have the final word on which projects would be addressed first, last or never, the spreadsheet could help you explain your decision to those

IT projects didn't exist then. Looking back, Wegner isn't sure whether the impetus for reorganizing the IT investment decision-making process originated on the IT or the business

"We've always had fixed resources and an ever-growing demand, but that's more true now than ever."

—John Zarb

who made the requests. If your job is to advise a board or committee, the spreadsheet could help them understand your recommendations.

Sound like a handy tool? Brian Wegner, vice president of health information systems at Fortis Inc., an insurance company in Milwaukee, thought so. Unfortunately, he didn't create it until *after* he had put in a network computer system that didn't pay off exactly as he had planned. In fact, Wegner says the company might have taken a different course in introducing networked personal computers if it had had such a tool. "I can't say the project wouldn't have taken place, but we certainly would have looked at it differently. We didn't understand all the costs back then," he says. But a system for setting priorities among requested

side of the company. But whatever the genesis, the payoff is clear: Wegner's system has simplified decision making in a complex organization. He has reorganized the way IT investment decisions are made, complete with a repeatable, numeric way of assigning priorities (see "Judgment Day," Page 53).

Using his spreadsheet model, Wegner can arrange project requests in numerical order of importance and predict which are more or less likely to be approved. "Having a formal process improves communication and ensures that we're working on the right things," Wegner says. At present, he's using the spreadsheet model for a pilot program in application development for Fortis. Eventually, Wegner says, it will be extended to the rest of the enterprise.

Wegner is one of a growing number



John Zarb: "Often you don't get to work on the project that would be most productive for the business."

PHOTO BY ROGER MASTROIANI

of CIOs eager to find ways to prioritize competing demands so that internal customers will understand and accept decisions to turn down some of their requests. The information technology world has long struggled with the issue of how to establish priorities, says John Zarb, vice president and CIO of Libbey Inc. in Toledo, Ohio. "We've always had fixed resources and an ever-growing demand, but that is more true now than it's ever been," he says.

Several factors combine to make setting and communicating priorities a pressing issue for CIOs. As business users become increasingly computer literate, they think up innovative ways to apply technology, thus increasing demand for IS services. In addition, regulatory changes have given rise to the need for ever more information gather-

done first, whether it's right or wrong for the business," says Bill Barnard, a founding practitioner of Barnard Norman Associates, a consultancy based in Sunol, Calif., that specializes in customer relations. The challenge for CIOs is to use metrics and standards instead of emotions, he says.

The human input can't be cut out of the process entirely, according to Wegner, but the influence of politics, ego and emotion can be decreased. "There will always be a need to use common sense to make sure that the model comes up with the right answers," he says.

Harrah's Boushy takes pains to ensure that the entire company knows what the IT shop is up to. A monthly report outlining IT's accomplishments and key deliverables for the coming month goes to people at the director

"There will always be a need for common sense to make sure the model comes up with the right answers."

—Brian Wegner

ing and reporting. What used to be an annual exercise is now almost constant, Wegner says. "The frequency and degree of change in the [health-care] environment has caused us to develop and change priorities during the year."

"Harrah's is highly regulated," says John Boushy, senior vice president of marketing services and IT at Harrah's Inc., a casino entertainment company in Memphis, Tenn. "All of our technology has components that help control and audit the business," he says. Harrah's has casinos in nine states and New Zealand, each with its own regulatory climate. Each rule change requires a change in at least one software application, "and these projects are not optional," says Boushy.

UNEMOTIONAL FEEDBACK

SETTING PRIORITIES OFTEN TAKES more than meets the eye, however. Politics and egos sometimes prevail over business needs. "Even if the IS people have a clearer understanding of company priorities than the users requesting a project, there is often a tremendous amount of internal politicking to get their project

level and above. IS members of product and steering committees are responsible for communicating the same information to their constituents. Quarterly and annual plans describe in more detail IT projects and priorities. "The real value of our annual plan is in telling people what they are going to get and what they will pay for it, providing metrics to show how that's changing over time," Boushy says. "We have to make sure that the business feels that we are making progress and using the resources provided to us effectively and efficiently."

Boushy has developed intuitively some of what Barnard and partner Rick Norman have elevated to a team-based methodology, called Customer Integrated Decision Making (CIDM). In a company that uses CIDM, the CIO assembles a cross-functional team to interview a group of internal customers to determine their wants and needs.

But it's not just a simple survey. The CIDM teams tape and transcribe the interviews to focus on the words customers use so the team can understand what customers *mean* as well as what they say. The team then creates a list of the customers' wants and needs, group-

Judgment Day

Criteria for IT investment decisions

BRIAN WEGNER, VICE PRESIDENT of health information systems at Fortis Inc. in Milwaukee, has identified the criteria by which each potential IT project is judged. Ultimately, a weighted score determines the project's place on the priority list. But there are exceptions: Some items can weigh more heavily than others regardless of their assigned score. For example, Wegner won't put a team to work on a project that lacks a sponsor no matter how high its score in other areas.

A high technical or organizational risk does not preclude acceptance of a project if other characteristics are favorable. Other criteria on Wegner's list include the following:

- **BUSINESS STRATEGY:**
How well does the proposed project fit with Fortis's overall business strategy?
- **ROI:**
What is the anticipated return on investment?
- **ABILITY TO DELIVER:**
What is the likelihood that the IS department will be able to fulfill the project requirements within a reasonable time?
- **BUSINESS READINESS:**
Is the business equipped to adjust to the changes the new system will demand?
- **REGULATORY OR MANDATED CHANGES:**
Is the proposed project required because of some change in the business environment?
- **BUSINESS VALUES:**
Is the change in harmony with the corporate value system?
- **COST ASSESSMENT:**
What is the best estimate of the project's cost?

—M. Williamson





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Compromising Positions

Committees add a common-sense check to setting priorities

ALTHOUGH THE CONVENTIONAL solution to setting priorities has been to give a steering committee the authority to do so, often such decisions are colored by the backgrounds of those on the committee. If it's headed by someone from sales, for example, don't be surprised if sales applications take precedence.

By assigning numerical values to projects, Brian Wegner's model enables him to rank requests from employees at Milwaukee's Fortis Inc. in order of importance; but numbers alone are not sufficient to dictate a decision. "There's always going to be the need to take an intelligent look at setting priorities," Wegner says. "If a model could do everything for us, we wouldn't need committees, but we do."

Here's how Wegner goes about structuring a three-level approach to committee involvement:

- **TOP LEVEL:** The IT investment board is chaired by the president of the company and composed of the heads of individual business units. The board addresses strategic investment issues and approves major projects costing upwards of \$250,000, for example.
- **MIDDLE LEVEL:** The IT steering committee is made up of vice presidents of key business areas. It is responsible for the quality of proposals brought before the investment board and has approval authority over midsize projects costing anywhere from \$30,000 to \$250,000.
- **LOWEST LEVEL:** Project priority committees, one for each of the key business systems, are headed by the IT manager responsible for the system. The committees approve projects that cost less than \$30,000 or require less than 500 work hours.

—M. Williamson

CIO PRIORITIES

ing items according to common characteristics. Finally, team members ask the customers to rank the categories in order of importance. To use such rankings as part of the priority-setting process, the CIO may have to include items that customers haven't thought of, such as infrastructure improvements, but conveying those priorities to the customers will be much easier and they will be more likely to accept the outcome of the process because their ideas were

Zarb says he began to "take up the sword of rationalization." He'd ask people to complete forms designed to explore a project's rationale, usually on a financial basis. The forms would delve into internal rate of return and relatively short-term ROI. "But we didn't ask what the project would do for our customer base, or in terms of reducing the cycle time, or getting information to our suppliers so that they can get raw materials to us more

"There is often tremendous internal politicking to get a project done first, whether it's right or wrong for the business."

—Bill Barnard

solicited from the beginning. And, says Norman, when customers experience the CIDM process, "their perception is that, finally, the information systems folks are really listening. So their participation grows over time once they experience having people listen to them accurately and intimately."

ROI RICHES

HOPING TO DILUTE THE INFLUENCE typically wielded by committee members who focused on the needs of their own business units,

quickly," he says. "The financial rationalization doesn't always tell the whole story. The model I have been searching for is one in which I can put in a number of parameters and extract what the project's influence would be on our business—on our customers, or cycle time, or reducing variability in our products." Zarb says he wants a decision-making process similar to the one the glassware manufacturer uses to decide whether to make a new product. When a new kind of glassware is proposed, he says, "the engineering department figures out what it

Bill Barnard (left) and Rick Norman use metrics and standards to tell the whole story.

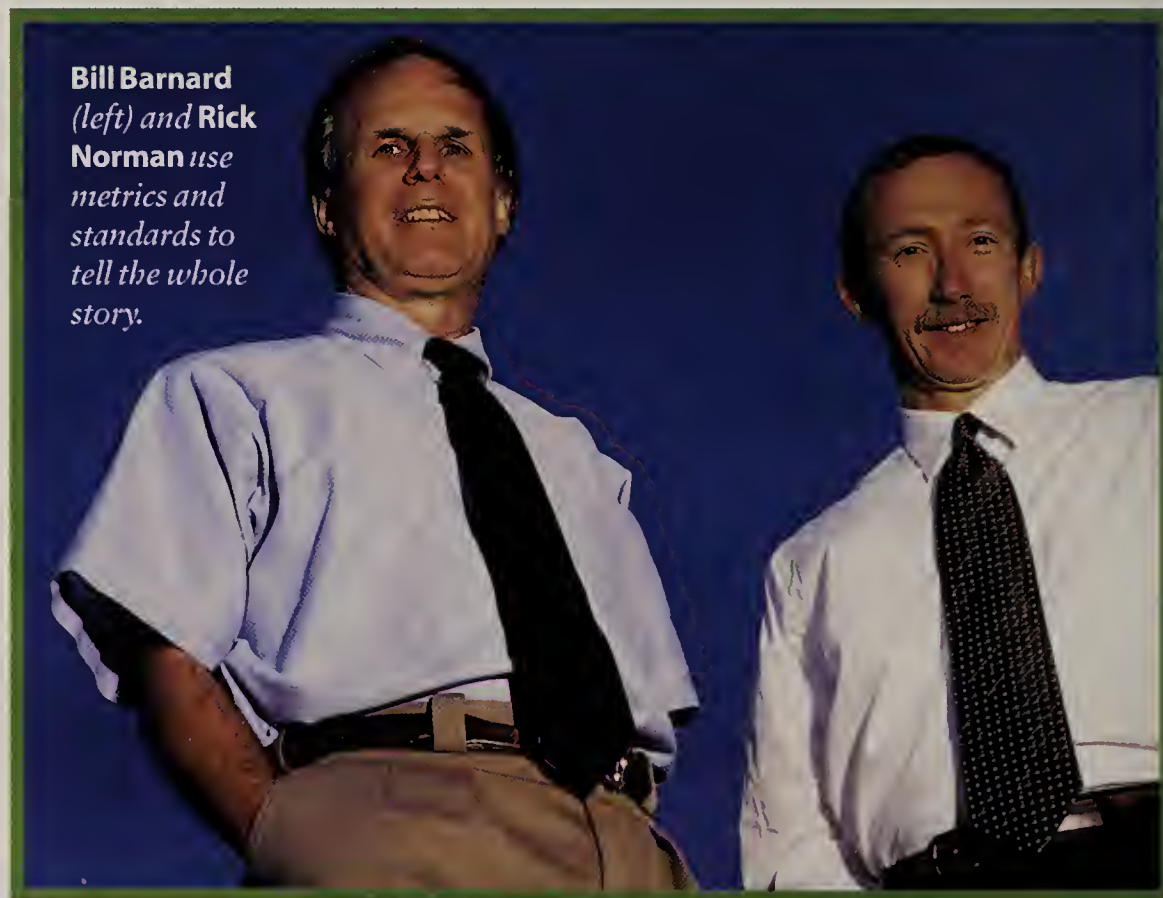


PHOTO BY CINDY CHARLES

The Sky's Not the Limit

When you work for the Air Force, your priorities must pass muster with Congress

FEW U.S. LEADERS HAVE AS MANY EXTERNAL customers as William C. James, Washington-based director of architecture and technology for the U.S. Air Force. Luckily for him, he doesn't get requests for technology from the general public, but he does have stringent marching orders from the U.S. Congress. The Information Technology Management Reform Act (ITMRA) of 1996, nicknamed



William James:
*getting marching
orders from Congress*

will cost to design it, manufacturing figures out what it will cost to make it, the sales group estimates sales volume and finance does the financial analysis. At the end of that process, either the project makes sense for the business or it doesn't. It's a very straightforward decision." Zarb wants to make the IT investment process just as rigorous, "not just giving everybody what they want, but asking what our [external] customers demand of us."

At Harrah's, Boushy consults with his peers on the business side before establishing IT priorities. Each proposed project is the subject of a feasibility study that includes a conceptual design, a comparison of the cost to build or buy and a projection of operating expenses. A business case is developed for each proposed

not is his, Boushy identifies two classes of customers whose input he solicits throughout the process: those who will use the product if it is approved ("users") and those who will pay the bills ("clients"). Users define the requirements, whereas clients provide the reality check. "The more functionality the users put into their request, the more likely it is to create complexity and cost," he says. "We need the clients to help us be sure that what the users call 'needs' aren't just a wish list but [have] real business value."

Wegner stresses the importance of assessing whether the business is ready for the degree of change that a new system will require. "That's something we want to make sure about," he says. "We could find a proposed new system technically feasible, but if the business isn't

"The Cohen Bill" for its sponsor, former U.S. Senator and now Secretary of Defense William Cohen, puts Congress in the position of a 535-member board of directors. Now James not only has to justify investment recommendations to his superiors in the Air Force, but he also must show them a 5 percent decrease in IT costs and a 5 percent increase in mission performance due to IT each year for the next five years.

"My mandate is to come up with an investment strategy to support the abilities my users say are most important to them," James says. "The bill also requires that I weigh those investments against infrastructure expenditures that don't matter much to the users but are important overall."

A numerical weighting system would help remove emotion from the decision-making process, James says, but for now it's based on negotiations among competing directors who he hopes will come to an agreement before a management board has to approve the investment plan. "If you've done your job and talked to the different directors, you can hope to have buy-in from all of the functional communities," he says.

—M. Williamson

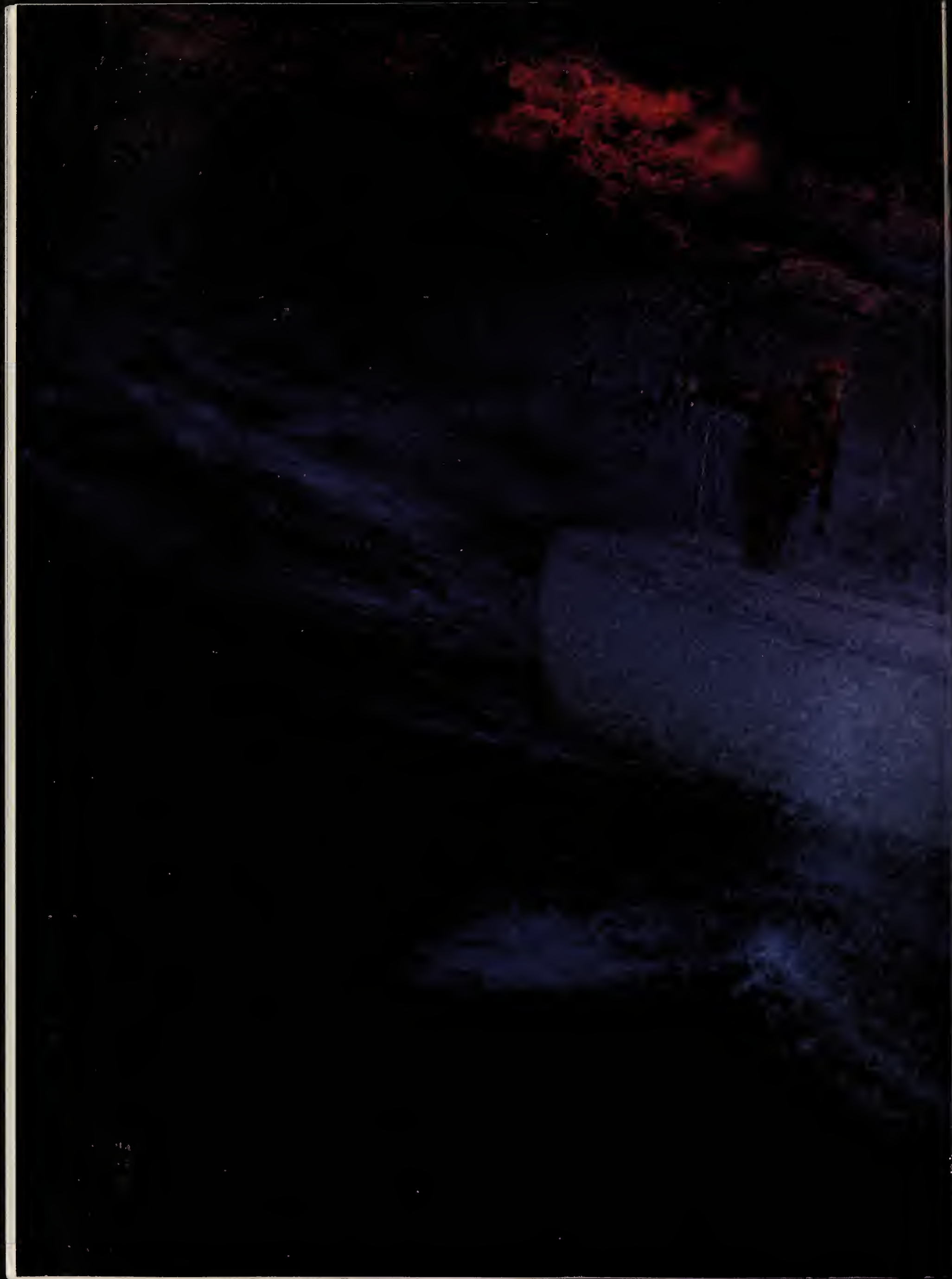
project, identifying its anticipated value in terms of cost avoidance, cost reduction, product differentiation or revenue enhancement.

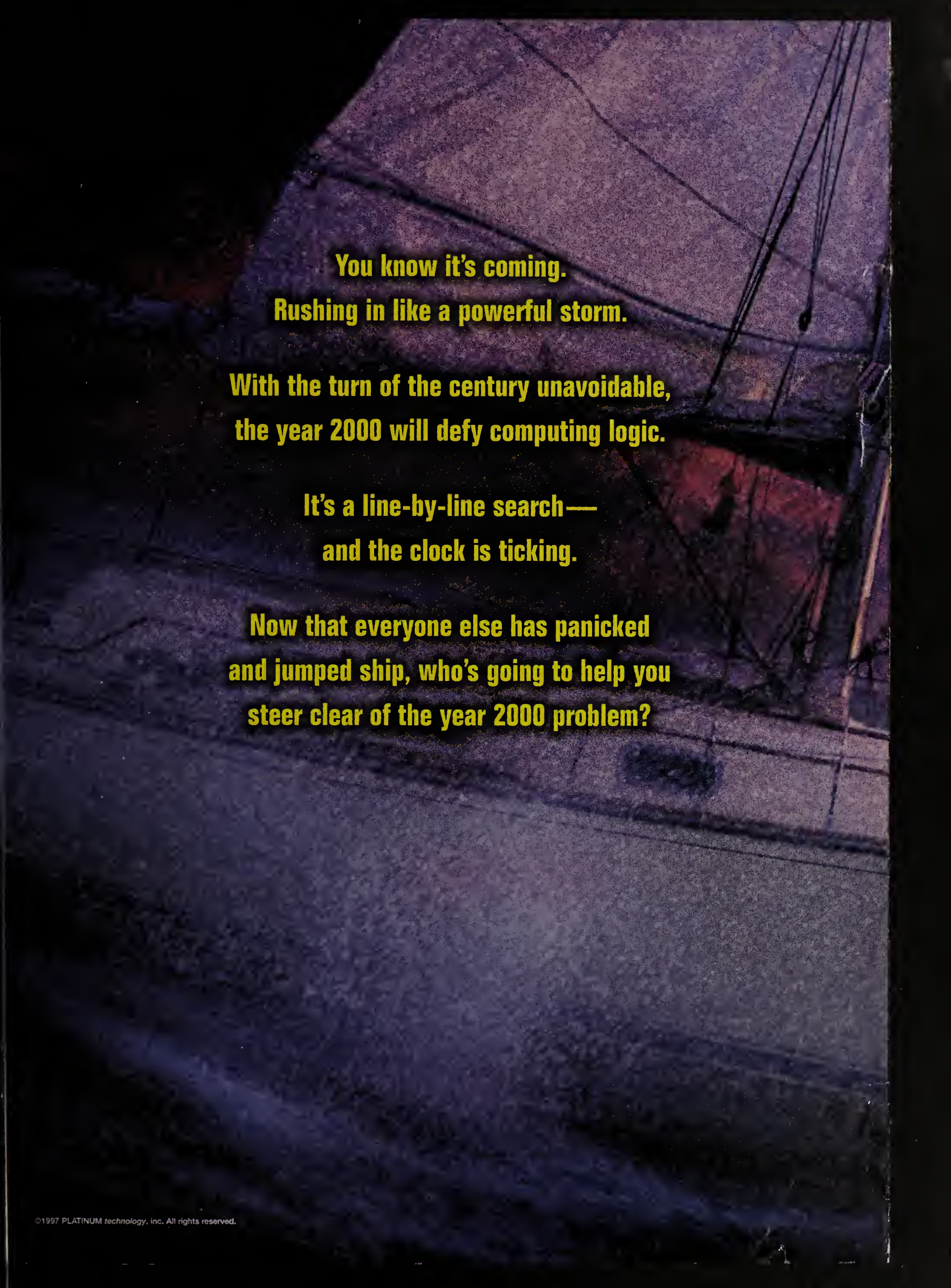
Although the ultimate decision to accept a project or

ready, it could bring our processes to a grinding halt." His method also calls for estimates of the technical and organizational risks involved—whether the IS organization has the technical skills required and what will happen if the project fails. But a high-risk project is not necessarily doomed. "Rather than not do the project, the focus would shift to a discussion of how to eliminate or lower the risk," says Wegner. "If everything else is good—a strong payback and strong business need are present—we work on ways to offset the risk."

Done right, a process that lets everyone see how priorities are established and projects are funded can be a real credibility booster for the IS department and the CIO who leads it. When decision time comes, everyone involved knows which projects should be undertaken and which must be delayed. Says Barnard, "If I'm a real company person, I'll have reached the same conclusion in my own mind. And if I'm not, it's no longer the CIO being the bad guy. It's me, refusing to be reasonable." **CIO**

Contributing Editor Miryam Williamson can be reached at mwilliamson@reporters.net.



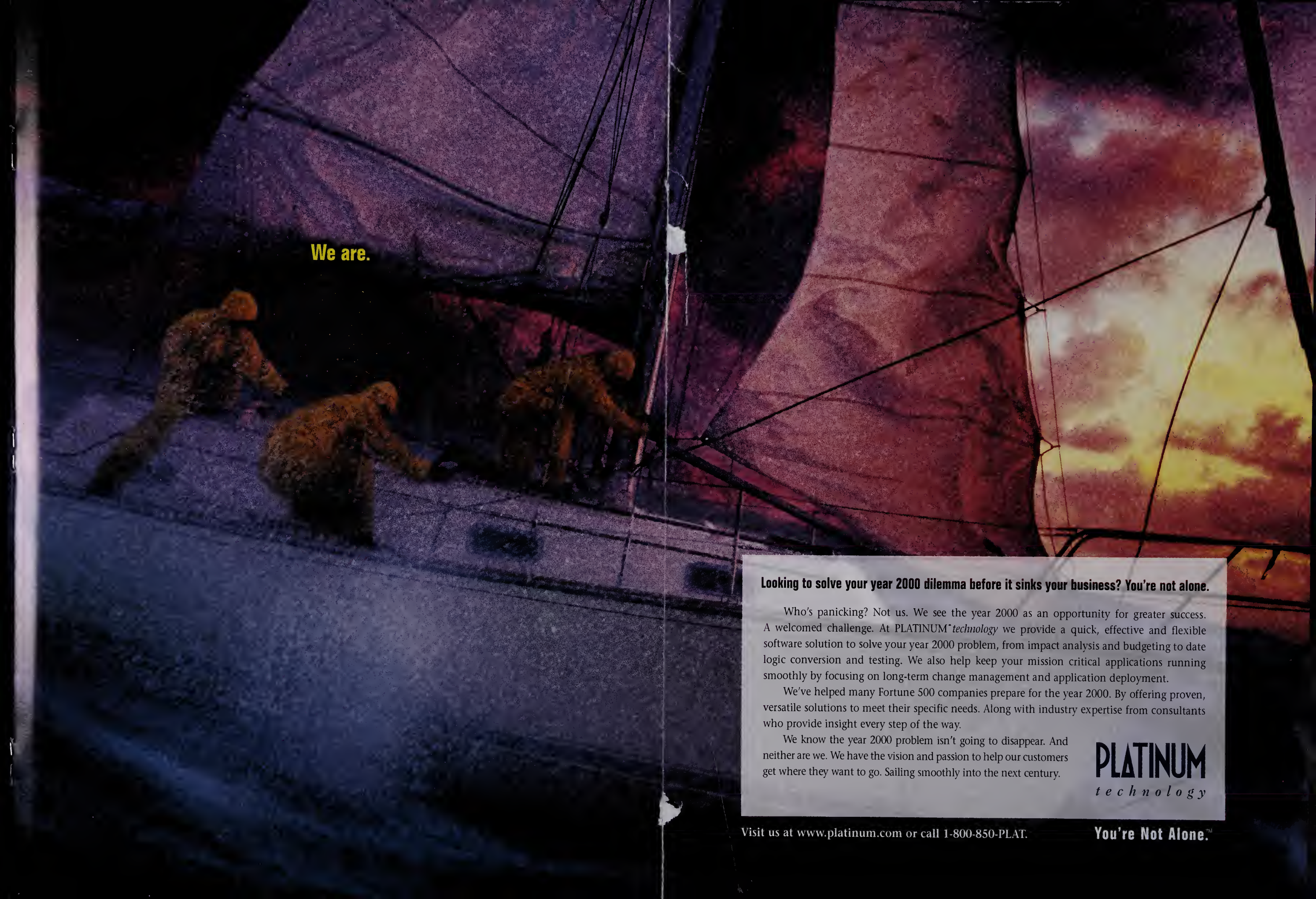


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Getting the Lead Out

By standardizing
IS operations globally
and cutting costs,
Mobil honed its
competitive edge

BY DANIEL GROSS

"The success of the new global information services organization is nothing short of fundamental to the achievement of Mobil's vision to be a great global company. If the implementation of a managed computing environment is successful, we can compete. If it's not, we'll fail."

—Lucio Noto, CEO, Mobil Corp.

Talk about pressure.

Three years ago, a group of 200 Mobil Corp. executives from around the world set out to study corporate staff functions, including IS, at the behest of CEO Lucio Noto. His mandate: Find a way to strip costs and bring them in line with industry benchmarks without adversely affecting the business. Among its findings, the group discovered that IS costs were not competitive enough to ensure growth.



As the company's global information manager, Ellen McCoy is pumping up the visibility of Mobil's IS function.

Reader ROI

FOR GLOBAL COMPANIES LIKE Mobil Corp. that want to stay ahead of their competition, an efficient IS organization is key. In this article, readers will learn how the oil giant streamlined its IS function by implementing standard software and hardware, downsizing staff and appointing a corporatewide IS leader.

PHOTOGRAPHY BY KATHERINE LAMBERT



Through the efforts of IS staffers like **Louis Garbarino**, global strategy and relations manager, and **Brenda S. Orth**, SME program director, Mobil hopes to save at least \$71 million.



Global standards had to be enforced, systems integrated, expenses rationalized and staffing levels reconsidered. Mobil's future viability, its potential to compete globally, landed smack on IS's shoulders.

Noto, CEO since 1993, was not alone in believing the \$80.8 billion company's future competitive standing and growth opportunity depended in part on its ability to reduce the expense of staff functions that support oil operations. "The oil industry has been moving rather rapidly to restructure, reduce costs and provide for future growth," says Eugene Nowak, senior energy analyst at Dean Witter Reynolds Inc. in New York. "Noto recognized that the company had a tremendous asset base but could get more out of existing assets." The organization answered Noto's challenge by eliminating more than \$1 billion in costs corporatewide over four years.

Occupying what had been an executive dining room at the company's Fairfax, Va., headquarters, the reorganization study troops began to plot a multiphase effort to make costs more visible and thus identify ways to save money and streamline staff

support operations. Opportunities to do so are easy to find in a company of Mobil's size. In 1995, the company produced 1.6 million barrels of oil daily, refined it at more than 20 different manufacturing facilities and delivered it to a network of 19,000 service stations around the world. Mobil prospects, manufactures and refines oil in 125 countries, from Nigeria to Indonesia to Singapore. But while the company might have preferred cost-efficient, globally integrated units, Mobil ran each business unit as a unique affiliated business, with its own human resources, accounting and IS departments.

Identifying the Problems

MOBIL LACKED a consistent IS environment. An IS unit based at headquarters ran the company's mainframe data centers, but although Mobil had some standards, they did not result in common systems. For example, Mobil maintained a mix of mainframe and client/server systems. In 1994, it had nine separate

e-mail systems, a variety of Internet access systems and three different operating environments: Windows, OS/2 and Macintosh. Basically, Mobil focused on its core businesses and let each business unit make technology choices that suited it best. And while each individual unit had a systems head who coordinated loosely with a corporate systems group, the company did not have a global CIO.

The disparate platforms led to high infrastructure costs and made rolling out common applications for basic functions such as word processing impossible. Mobil was spending about 1 percent of its total revenues on IS, but technology decisions were made independently by each unit, so the company couldn't take full advantage of its size to purchase IT products centrally. In addition, the hodgepodge of computer hardware and software prevented Mobil employees from sharing data

efficiently. "[Organizing] to collaborate globally or even locally was difficult and labor-intensive," says IS redesign team member Louis Garbarino, Mobil's global strategy and relations manager.

At the Drawing Board

THE IS REDESIGN TEAM worked closely with consultants from Booz, Allen & Hamilton to make the IS function meet Noto's challenge. "We did a comprehensive diagnostic [review] of all Mobil's IT processes" in early 1995, says Chris Disher, a principal at Booz, Allen in Chicago. "What we found was that it had many pockets of expertise that were best practices. It had examples of groups that could work effectively in a virtual teaming kind of arrangement." Booz, Allen also found that the main weakness of the decentral-

Mobil ran each business **unit** as a unique affiliated business, with its **OWN** human resources, accounting and IS departments.

Sorting the Mail

Mobil's multiple e-mail systems were costing the company time and money

E-MAIL, AN APPLICATION companies often take for granted, neatly encapsulates Mobil Corp.'s IS conundrum. "E-mail is ubiquitous at Mobil. Business as it is currently conducted couldn't occur without it," says John Norton, a messaging consultant with Lotus Consulting in Manassas, Va., which Mobil hired to help sort out its e-mail troubles. As one of the IS professionals Mobil

let go during a wave of downsizing in 1996, Norton was already familiar with the company's system.

Before the redesign, Mobil had nine e-mail systems, which were expensive to maintain and slow to connect with one another. The company spent about \$14.1 million annually just to maintain the 39,000 mailboxes. Realizing the need to standardize, Mobil turned to Lotus Consulting in May 1996 to help it move to one system without losing capability and to save money in the process.

It turned out Mobil could run and maintain a single system with 32 fewer full-time employees than the 69 who had been required before, at a savings of \$3.2 million annually. Based on benchmarks of other e-mail users, "our original estimate

was that it would cost \$430 per mailbox, and that's what we had in our business case," says Keith Croxton, a Dallas-based computing adviser in Mobil's global information systems division. But Mobil felt it could do better than that and wound up spending \$350 per mailbox, less than any of the benchmarked companies were spending.

The decision was made to use Lotus Notes for e-mail, and with the help of Lotus Consulting, Mobil started implementing the system corporatewide in October 1996, three months ahead of original estimates. The company also has put several applications on Notes; moving the company's internal phone directory alone will save about \$200,000 in printing costs annually.

—D. Gross



David Askey, engineering and design project leader, deals with the logistics of implementing SME.



ized IS shop was redundancy. "It's hard to count the number of Windows 95 evaluations that were going on," says Disher.

To solve those problems, Booz, Allen proposed the following concept: centralize the sprawling IS operation's administration under a global information manager, eliminate the different platforms and applications, and get all Mobil employees in all business units to work on compatible hardware and software. Under that so-called "standard managed environment" (SME), the jumble of platforms, desktops and software would be replaced by standards that would allow units to add functions as needed. Such a computing enterprise could be managed with far fewer people than Mobil's mélange of independent systems required, so the company could save money by cutting up to 40 percent of its IS staff

without affecting IS's ability to support the business. Moreover, Mobil would be able to cut expenses by buying hardware and software in bulk. The new environment also could be updated easily. With a standard environment, if Mobil wanted to give each of its employees a new Web browser, for example, it could do so smoothly and quickly. "The distribution of the updated version would go to the regional servers around the world, and that update would then occur when the users logged on," explains David McKay, Mobil's former global systems manager. Although switching to SME required Mobil to invest about \$68

million upfront, it also promised annual savings of at least \$71 million.

In addition to allowing IS to satisfy Noto's vision, a standard managed environment would by definition create a strong, centrally administered IS function that would regard business units as customers. Such a paradigm shift would require a leader with a strong management background who was familiar with the business.

Ellen McCoy was running the \$3 billion global Mobil International Aviation and Marine Inc. (MIAMI) unit when she was asked to simultaneously take on leadership of global IS in the fall of 1995. McCoy had joined Mobil in 1976 and had risen through the ranks of the supply and trading division. Her global business management expertise and past experiences with technology provided an understanding of the business's demands on IT and made her the logical choice to provide such input to the redesign team.

When the company began to roll out SME in Fairfax and Dallas, McCoy completed her transition from the MIAMI unit and was named global information manager in January 1996.

Shrinking Pains

IMPLEMENTING SME has proved a difficult and sometimes painful task. Over the course of the project, scheduled for completion in early 1998, annual systems costs are expected to fall a total of 40 percent. Much of the savings has already come from reducing Mobil's IS roster, including outside consultants, from 4,400 in 1994 to the current level of 2,400. That change has been achieved "with a great deal of pain," McCoy says.

The downsizing came in two waves. Once Mobil's team of executives embarked on the overall company revamp in early 1995, the company froze work on all projects, so the outside consultants working on them were no longer needed. That fall, McCoy asked group leaders to evaluate their employees' business and partnering skills as well as technology skills to help determine which employees would be best suited to the new environment Mobil was building. Those who didn't rate high on all those skills were offered a severance package. The two initiatives reduced the head count by about 25 percent by the end of 1995. More people were let go in early 1996. "We tried to do that as fast as possible so people wouldn't just be waiting," says McCoy.

Another sizable chunk of staff cuts came when Mobil consolidated the six mainframe data centers it maintained around the world, each of which had employed 25 to 50 people in 1994. By June 1996, the company was down to two centers, in Dallas and in Maidstone, England. Last November, Mobil sold the British center to Computer Sciences Corp. The

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“What we seem to be going back to is a kind of trade **union** mentality, where a worker’s importance lies in his skills and competencies in the **overall** marketplace.” —Louis Garbarino

center in Dallas, which occupies a two-story facility the size of two football fields and is staffed around the clock by about 150 employees, now handles the company’s central data needs.

The large-scale job reductions complicated the concurrent shift to SME. In addition to inspiring the normal resistance that accompanies any radical change in a large organization, the cuts changed the way Mobil’s remaining IS staff regard themselves and the company. Garbarino, a 15-year Mobil veteran, says he sees the company moving

away from a paternalistic atmosphere in which people could count on guaranteed lifetime employment. “What we seem to be going back to is a kind of trade union mentality, where a worker’s importance lies in his skills and competencies in the overall marketplace,” he says. The downsizing also created morale problems that McCoy and other Mobil executives have tried to address. To combat a sense of alienation, McCoy chose veterans like Garbarino to become top deputies. She also brought in outsiders with experience in implementing SME under similar conditions.

But McCoy’s chief means of convincing the IS rank and file of the value of SME has been through personal evangelism. To spread the gospel of SME and overcome resistance to it, McCoy travels to Mobil sites all over the world and holds town meeting sessions with IS employees, fielding their questions about technology changes as well as addressing their concerns about employment issues. The purpose of the meetings is both to find out what employees have on their minds and to share her vision of Mobil’s IS function.

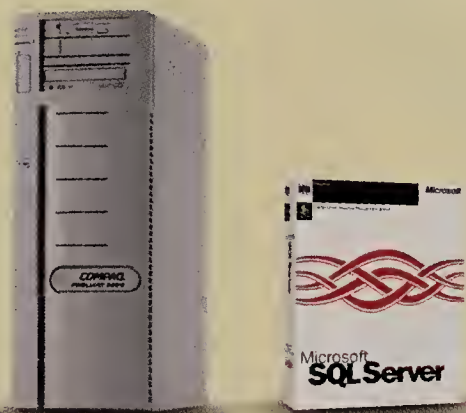
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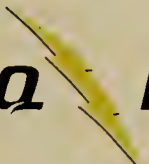


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Under Construction

McCOY COMPARES the process of implementing SME to remodeling a house: When you rip up the floor, you never know what you'll find. As a consequence of having a decentralized IS environment, nobody really maintained an accurate inventory of the company's resources. "There were far more [applications] than we thought, a lot of different word processing, spreadsheet packages," says David Askey, engineering and design project leader for SME. "Even within the same group, there were different applications being used for the same thing, and [people] were fairly religious [about those choices]." And the logistics the company has had to deal with during the implementation have been overwhelming. Before standardization, Mobil had more than 39,000 electronic mailboxes and more than 40,000

digim, business units received an IT budget and generally adhered to it regardless of their technological needs. Now each business unit obtains IT services in a two-tiered process. For the hardware, software and staff time necessary to install and manage the SME, each business unit negotiates service-level agreements and costs with the global IS group. But if, say, the chemicals unit decides it wants some technology that doesn't comply with the new standards, it must go through an intensive process to justify the expenditure and must pay for the nonstandard equipment out of its own budget. As a result, business unit managers now have a greater understanding of IT costs. "I looked at [this year's] budget and said, 'I'm calling in my IS business manager to find out how I can cut these [IT] costs,'" says Mike Goldberg, who led the IS redesign team and is now general manager of Mobil's global crude oil supply and trading unit.



McCoy compares the process of implementing SME to remodeling a house: When you rip up the floor, you never know what you'll find.

desktops in more than 100 countries, and some of the desktops required new hardware and software.

The key to smooth SME implementation was to establish a new relationship between IS and business units. As a former IS customer, McCoy has labored to have the IS employees regard themselves more as service providers than support staff, and she has endeavored to turn Mobil business managers into smarter consumers by teaching them about the costs of IT. Under Mobil's previous para-

Toward the End of the Tunnel

THOUGH THE companywide overhaul and the rollout of the SME remain works in progress, they have already begun to pay off. "There are strong signs that [the redesign] is bearing fruit," says Nowak of Dean Witter Reynolds. "[Mobil has] been able to reduce costs fairly significantly." Total employment at Mobil fell from 73,700 in 1992 to 50,400 in 1995. Mobil has reduced its operating costs since 1991 by over \$1.1 billion. And in the past three years, IS costs have fallen from 1 percent of total revenue to .5 percent, which puts IS in a good position to help Mobil achieve Noto's original goals.

Of course, the success of SME must be measured in more than just dollars and cents. If the new envi-

ronment won't allow Mobil employees to function more efficiently, the whole process will have been just a cost-cutting exercise. For example, Mobil's employees are looking forward to the day they can log on to their desktops and applications remotely using laptops, which wasn't possible under the previous paradigm. Instead of simply servicing the company's information needs, McCoy says, "we need to be able to fuel Mobil's growth and performance." **CIO**

Daniel Gross is a freelance writer based in New York. He can be reached at dangross@panix.com.

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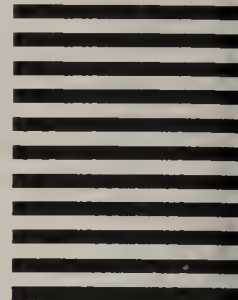
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Web War

Not really. But when webmasters and CIOs can't resolve their differences, the chaos rivals that of a bad B-movie.

BY CAROL HILDEBRAND

if you believe everything you hear about webmasters and CIOs, you might think the relationship is a clash of diehard rivals, a Godzilla versus King Kong blowout in conference room B. Popular lore about the animosity between the roles is familiar enough that a spoof of the dispute by executives from Dell Computer Corp. at a *WebMaster* magazine-sponsored conference in August 1996 drew knowing chuckles from the crowd.

As part of the role-playing shtick, Kenneth Hill, online business development manager of Dell Online, donned a hippie wig, and Andy Greenawalt, the company's vice president of information services for the Americas, wore a policeman's cap. "We drew the positions as extremes, but the nugget of truth is still there," says Hill. "We've actually had all these battles."

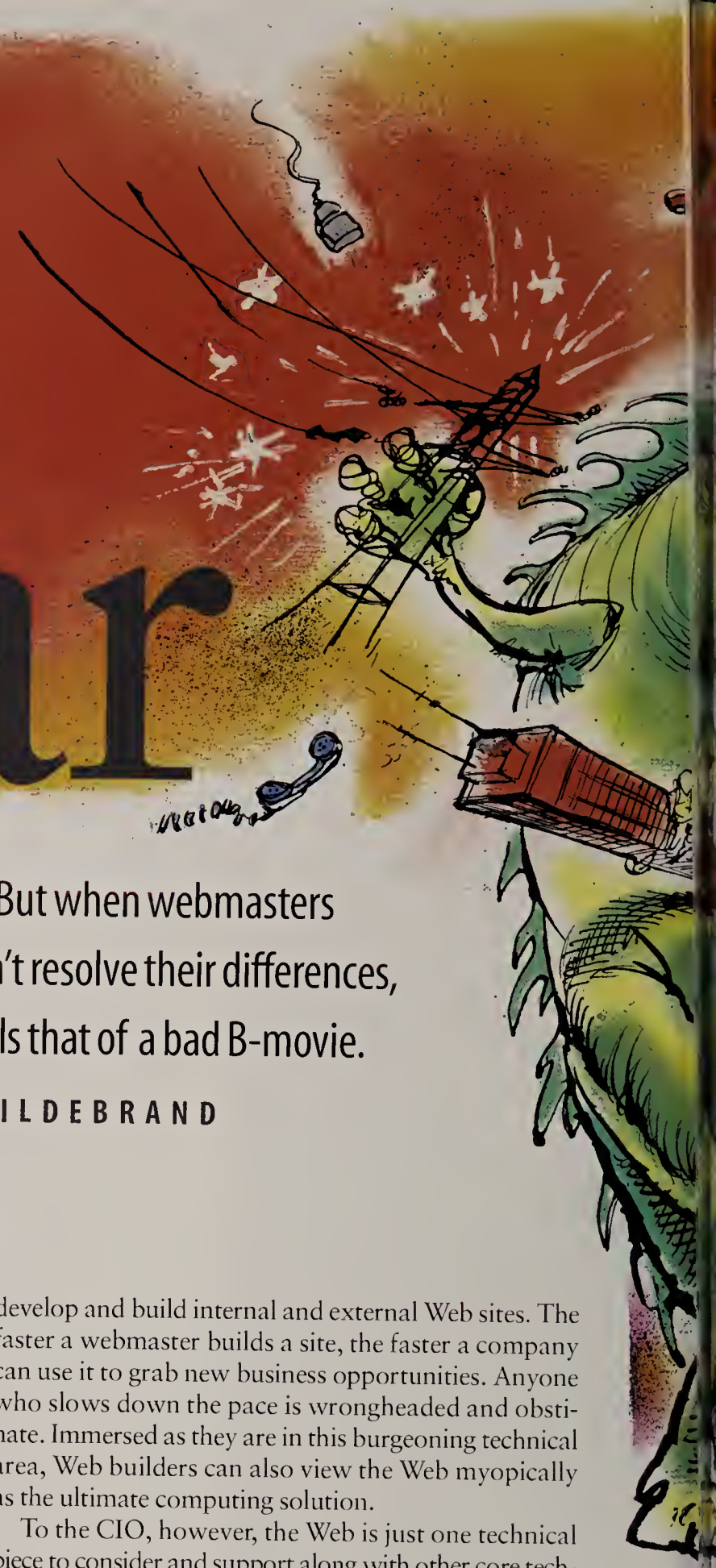
Is it really that contentious? Say it ain't so. Well, the stereotype is based on some element of reality, says Harry Max, Web consultant and founding webmaster at Virtual Vineyards, a direct marketer of specialty wines and gourmet food in Palo Alto, Calif.

IT executives and webmasters are likely to butt heads on a number of different issues, he says. The webmaster's job is to experiment with unproven technology to

develop and build internal and external Web sites. The faster a webmaster builds a site, the faster a company can use it to grab new business opportunities. Anyone who slows down the pace is wrongheaded and obstinate. Immersed as they are in this burgeoning technical area, Web builders can also view the Web myopically as the ultimate computing solution.

To the CIO, however, the Web is just one technical piece to consider and support along with other core technologies, methodologies, business applications, security—"all the stuff that IT is responsible for," says Max. In many organizations, he says, "the CIO is the anchor of the IT institution and the webmaster is a solo space explorer, off looking at way-out-in-front technology."

But is that the case at all organizations? Of course not. At many companies, CIOs are ardent proponents of the Web. Likewise, many webmasters see beyond their own digital fiefdoms to recognize the very real barriers to practical Web business application. Hill and Greenawalt stress that the important thing to learn from the stereotype is how to get beyond knee-jerk conflicts and get down to problem solving. Following are excerpts from their presentation and selections from follow-up interviews on how they got past the entrenched, us-versus-them argument and identified and fixed underlying problems.





The History. Hill's team was working on a sales-force automation project about three years ago when it first saw the possibilities of the Web. As his group explored the project, they discovered that Greenawalt's IS folks controlled access to most of the databases of information that Hill and company coveted as content. That's when things got a little tense, and Hill and Greenawalt cheerfully admit that the road to success was paved with more than a few arguments. But the two groups were able to resolve their different views and compromise on a program that built a thriving Web presence: The external site now gets 12,000 unique visitors daily, millions in sales monthly and millions in operational savings annually. The intranet has 5,000 users, 150 different content areas and 25,000 pages of content, and it is still growing.

<http://www.cio.com>



THE CIO

Andy Greenawalt, Dell's vice president of information services for the Americas, has spent almost all of his 20-year career working in various information technology functions, including application development, data center management and network management. He describes his career path as "pretty typical of a CIO."

versus



THE WEBMASTER

Kenneth Hill, online business development manager of Dell Online, started working at Dell 11 1/2 years ago. He began in the manufacturing division, where he engineered, designed and developed manufacturing software and custom databases. He moved into sales nine years ago. He started using online tools for customer service, and "that's when I started getting into the Internet and intranet," he says.

PHOTOGRAPHY BY WILL VAN OVERBEEK; ILLUSTRATION BY DAVID SMALL

CONFLICT 1

Opportunity versus Risk

THE WEBMASTER Kenneth Hill: "The Web represents unlimited opportunity. We could really increase our revenue by jumping on this technology aggressively. There's also a cost savings if we can use the Web for customer service and to open up a new selling channel. Customers should love it—it's very easy to use. And everybody is talking about the Web and what smart companies are doing with it. If we can get our brand out there and build up a 'happening and progressive' reputation with our customers, we'll enhance our corporate image. Sure, there are some risks, but if you don't take risks, you lose your competitive edge. But we can't sit around—we need to act immediately."

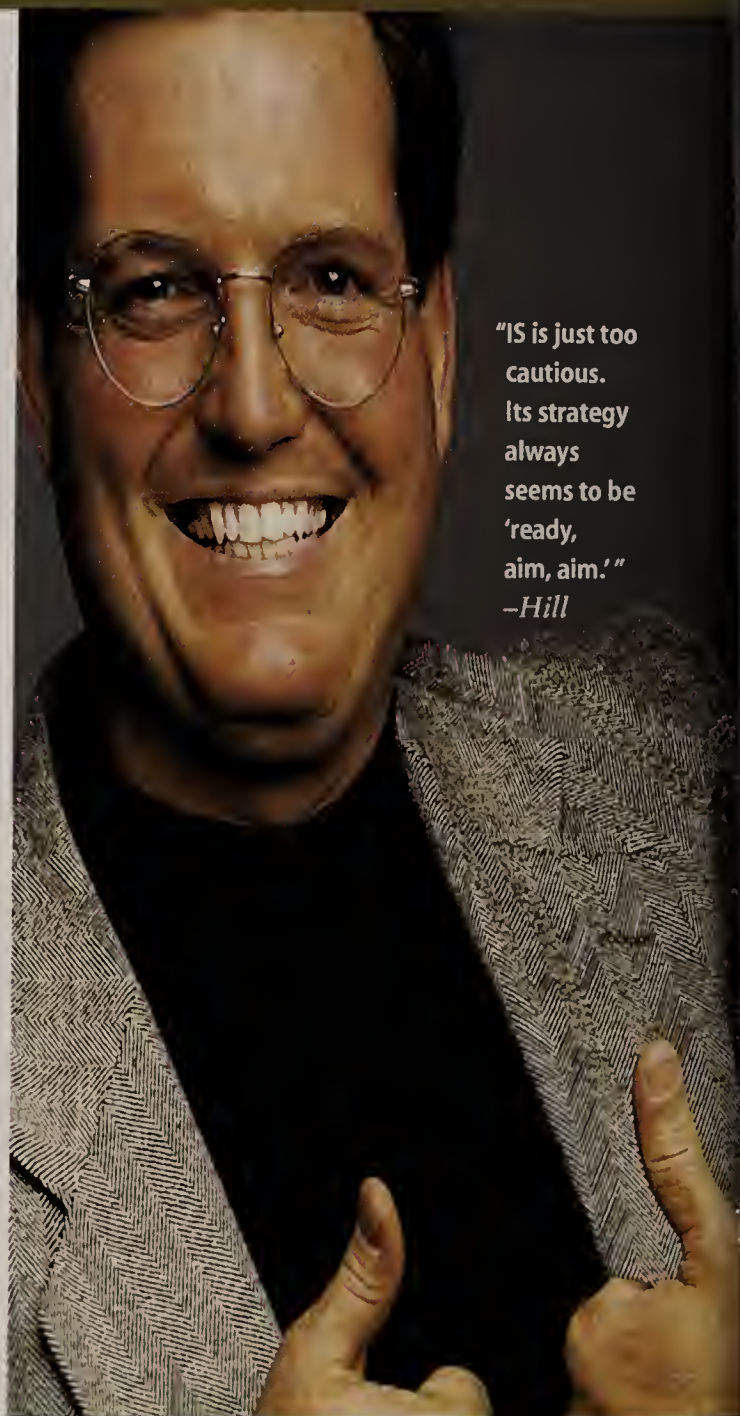
THE CIO Andy Greenawalt: "Well, IS knows one thing about new technology that webmasters ignore—it's unproven, and that means risky. The Web represents an enormous opportunity to make money and enhance corporate image, but it's also a risk. Have you thought about the risk of dealing with all that new money rolling in via unsecured transfer? Just what we need. And the first customer who gets burned doing business on the Web will be sure to blame us—not themselves, not the technology, but us. So much for shining up the corporate image. As for saving money, that's what you say. Where are the numbers? We don't even know how much this is going to cost, so how can we possibly predict how much it's going to save?"

SOLUTION 1

Joint Risk Evaluation

In order to separate good opportunities from bad risks, Greenawalt and Hill needed to refocus their discussion on both internal and external customer needs. If a Web/IS team concentrates on a joint concern with customer desires, each faction becomes less concerned with defending its position and more concerned with working out a solution. In Dell's case, Hill and Greenawalt put together a Web team of people from IS and from Hill's group, Online Services. The group polled internal customers (for the intranet) and external clients (for the Internet site) on what they'd like to access online. For example, would prospective intranet users get excited about Web-enabled sales-force automation tools? Would external customers like better technical support on the Web? The idea was to identify customer needs and desires, says Hill.

Then the group matched the customer wish list with Dell's products and services to see whether a particular Web project would prove valuable to disparate business functions. Next, "we went off to talk to business units to see how these things fit in with the business model and strategy," says Hill. The group then found business executives willing to act as departmental sponsors (that wasn't very difficult: CEO and company founder Michael Dell is an enthusiastic Web sponsor), analyzed the information they'd gathered and came up with a strategy for the Web. The point, says Hill, is that "the Web wasn't about what the marketing department wanted or what the IS department wanted or what I wanted. It was about what we could do."



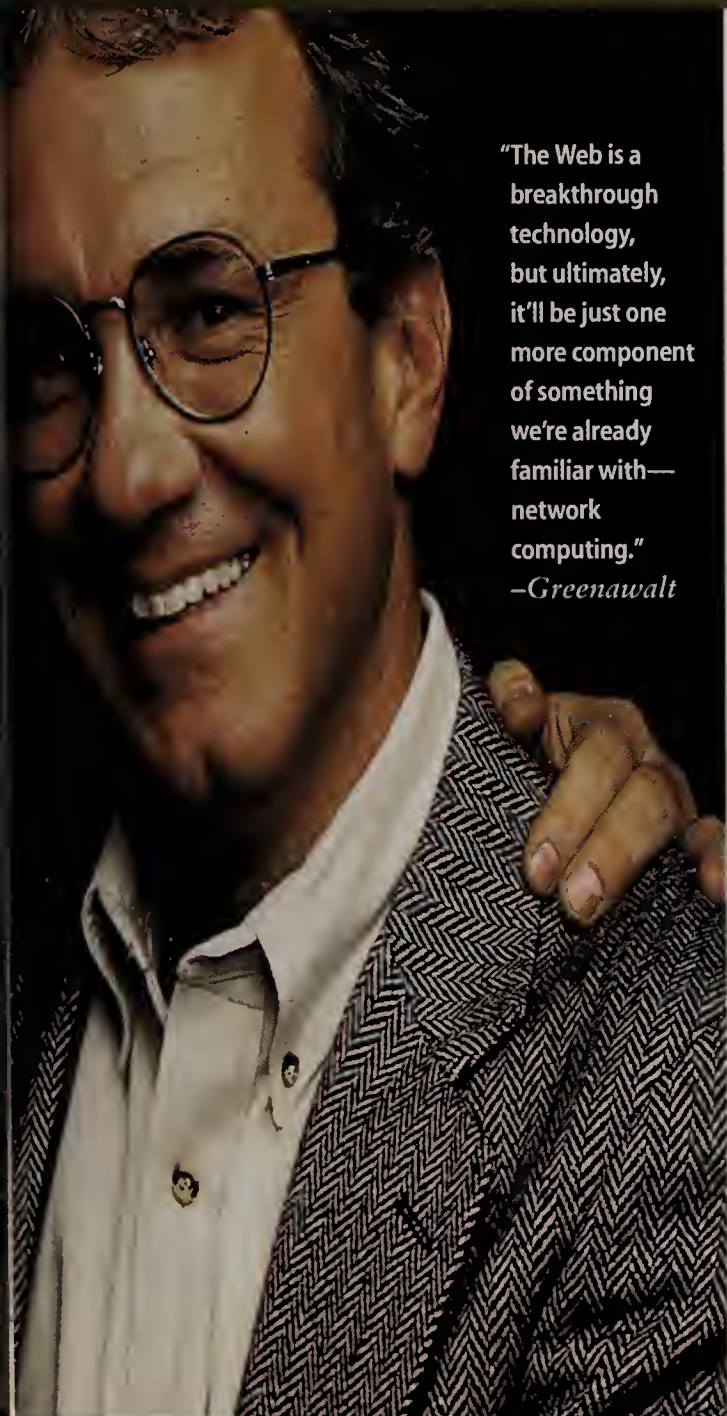
"IS is just too cautious. Its strategy always seems to be 'ready, aim, aim.'"
—Hill

CONFLICT 2

Customer Needs versus Company Needs

THE WEBMASTER Kenneth Hill: "I'm actually curious to know how you'd even recognize a customer of this company. We've spent our whole careers in line business units; it's our job to talk to the customer, and we work hard to give them what they want. IT folks, meanwhile, are busy arguing about the latest programming language. Besides, our clients want perfect service, and I don't think you can deliver that. If we put up a new customer support system, it can't have technical glitches. How can IT promise that when you can't even keep my desktop PC up and running? I can't risk putting IT in contact with my customers. You'll screw up the relationship we have with them."

THE CIO Andy Greenawalt: "Just because we don't spend time with what you call 'paying customers' doesn't mean we're ignorant about customer service. We support thousands of internal customers every day—people like you, who are every bit as demanding as outside clients. IS has always been a service organization here, and we take our responsibility to our users seriously. Our management controls and valuable technical knowledge will keep you from making unnecessary beginner's mistakes. As for our technical abilities, keeping your PC running is one very small part of our job. We keep the infrastructure going, and that's where the Internet action will be. It isn't about desktops. It's about servers, and we've been running servers in the data center for decades."



"The Web is a breakthrough technology, but ultimately, it'll be just one more component of something we're already familiar with—network computing."
—Greenawalt

SOLUTION 2

Go to the Source

Hill and Greenawalt learned that a Web team can best represent customer needs by involving customers in the site implementation. In Dell's case, the original Web team expanded into a cross-functional implementation team with representatives from business segments, Online Services, IS, a smaller IS group responsible for Dell's SAP project, marketing, public relations, product groups, the legal department and international divisions. The team made sure that the external customers were represented as well. Hill began surveying a focus group of about 100 customers quarterly about Internet issues, and the Online Services team continues to seek customer feedback informally, Greenawalt says. The idea, say Greenawalt and Hill, is to apply the experience of each function where it is needed in the Web development cycle. Since each group's expertise is recognized as valuable, team members are less apt to downplay others' contributions.

The team hammered out a set of roles and responsibilities for each aspect of the implementation plan. Everybody shared in planning and budgeting. The business segments were responsible for prioritization and content. Online Services took care of publishing duties like development and support, Web operations and Web training. IS took the lion's share of infrastructure duties, like network, server and desktop management, although Online Services also lent a hand. The important thing, says Greenawalt, is to keep momentum going "with a continual discussion about what we want to do, what we want to fund and what can wait."

CONFLICT 3

Speed versus Caution

THE WEBMASTER Kenneth Hill: "IS is just too cautious. Its strategy always seems to be 'ready, aim, aim.' Well, we don't have time to write a strategy and a plan! If we wait, the competition will get there before us, the technology will evolve and we'll fall hopelessly behind. Instead of piddling around on some lukewarm pilot program, we should do a 'saturation bombing' of the company. We'll throw a bunch of projects out to the user community and see what they think. We'll be able to quickly gauge users' reactions. We need rapid deployment; we can test and refine things on the fly, and user feedback can help pinpoint fixes and opportunities. Once they try the Web, users are bound to get hooked and want more."

THE CIO Andy Greenawalt: "Have you ever watched a technology project fall apart publicly? It's not a pretty sight, and it's not good for your career. The folks in finance get very upset when you waste capital. Your implementation idea looks like the 'ready, fire, aim' model."

"We need to be prudent here. We should use a system development cycle. You identify and prioritize opportunities, establish a strategy, design and develop the application, test it and carefully deploy it using small pilot programs. If we put together a good methodical plan based on proven techniques and we're very fortunate, we'll get some good results and satisfied customers."

SOLUTION 3

Build a Procedural Infrastructure

Hill and Greenawalt realized that they had to know which projects warranted the most attention before they could decide on an implementation schedule. The team decided to build a framework based on both customer needs and Dell's capacity to implement each application. Building on the information they'd already gathered, the team figured out which Web initiatives customers wanted most and what implementation pace was comfortable for them.

The idea was to make sure Web features were created based on customer interest rather than on ease of development. "Sometimes we could develop something really fast, but the customer wasn't yet ready to take it," says Hill. The group compared its progress with that of the competition, tested available technology, got executive support, approved budgets and schedules, and came up with policies



"We need rapid deployment."
—Hill

"We need to be prudent."
—Greenawalt

and procedures to govern the whole process. "Then we buckled our seat belts and took off," says Hill. "We're really moving rapidly, but without the policies and procedures, I doubt we'd be as in control of the ship as we are today."



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CONFLICT 4

Web World versus the Big Picture

THE WEBMASTER Kenneth Hill: "A big part of the problem is that you're scared of the Web. You know it's going to dominate everything you do, and you're fighting to protect your turf. Well, it won't work. Didn't you learn anything from the client/server revolution? The Web will make that look like a barnyard scuffle by comparison. This technology is cheaper than any of the systems you're working on; look at the price difference between custom-designed EDI projects and Web-based electronic commerce, for example. The Web is electronic commerce—everything else will become obsolete. The Web is the ultimate end game in client/server, and it's going to make your job obsolete."

THE CIO Andy Greenawalt: "The Web is a breakthrough technology, but ultimately it'll be just one more component of something we're already familiar with—network computing. It has immense value in niches but it won't take over the world. You mentioned electronic commerce, for example. You're right; the Web has a big role to play there, but it's not going to replace all the other things we're using for [electronic commerce]. EDI, for example, has far better security than the Web right now. Running the IT infrastructure involves things you've never given a second thought to, from network management to security administration. Web technology is just one more item to add to the IT portfolio."

SOLUTION 4

Fitting the Web Into the Puzzle

The Web team's previous work helped it look at the Web as part of the big picture, say Hill and Greenawalt, so this issue was not as divisive as it could have been. Another helpful factor was that the team was not laboring in isolation. By involving employees from all parts of the company, the team reduced the chances of building Web applications that didn't work with existing systems.

The Web team realized that the Web was not going to take over Dell's systems plans—its SAP implementation is going forward, for example. But by figuring out where the Web has the most strategic impact—marketing, services and sales—the team could deploy the technology most effectively. Fitting the Web into the existing infrastructure also involved a lot of selling on Hill's part, to help teach both internal and external customers to turn instinctively toward the Web. "It has to be part of the whole mainstream business thinking process," says Greenawalt, "but knowledge and appreciation of what the Web can do was very uneven. Some groups were way



up the curve on Web stuff and some weren't. Kenny and the team did a great job of advertising successes and moderating expectations."

Finally, the group is still working on linking legacy systems to the Web, and it will be for some time. "It's tough," says Greenawalt. "We don't want to pull information off the mainframe if we don't have to, because we don't want to end up with multiple data structures all over the place. It's a cause-and-effect we don't like." **CIO**

Senior Editor Carol Hildebrand can be reached at cjh@cio.com.



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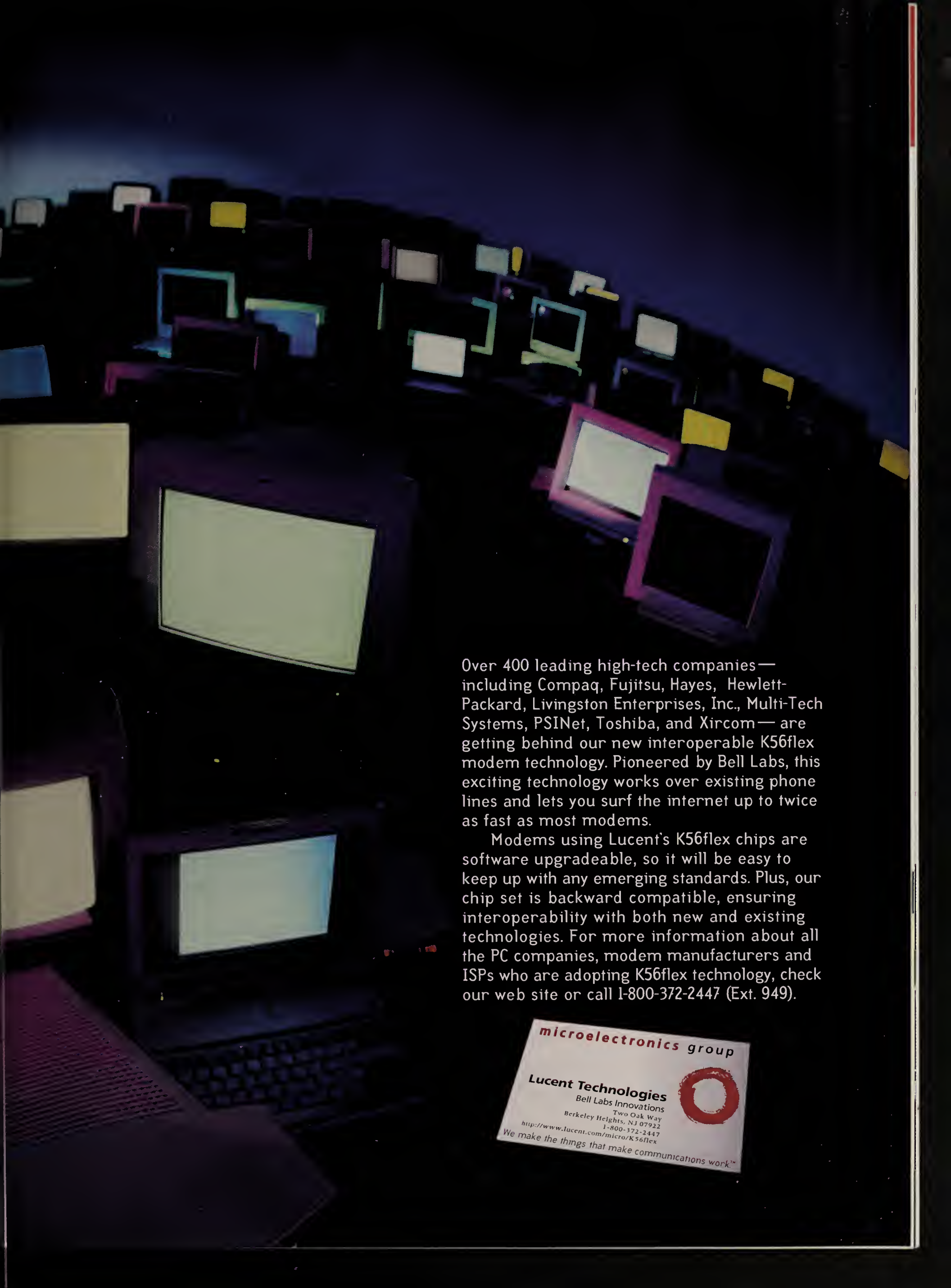


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The Next Wave

The new world
of information
is about to change
our lives

BY MICHAEL L. DERTOUZOS

Entrepreneur, consultant and soothsayer Michael L. Dertouzos has advised policymakers and CEOs for 20 years on technology's impact on society. In *What Will Be*, he charts a richly detailed map of the changes that new technology will wreak in every aspect of our lives—the “Third Revolution” that he believes will rival the Agricultural and Industrial revolutions.

Dertouzos, a native of Greece, has headed MIT's Laboratory for Computer Science since 1974. With half a dozen successful startup companies and several technology patents to his credit, Dertouzos consults on technology and social issues for the White House, Fortune 500 companies and governments abroad.

THE VISION

The Information Marketplace

The Industrial Revolution began in England when the steam engine was invented in the mid-18th century. Driven by those new mechanized horses, people left the farm for the city's factories where they would earn higher wages; they also had to endure crowded, unsanitary conditions and abusive labor situations.

The second industrial revolution, as it is often called, appeared by the end of the 19th century, with a new wave of innovations such as electricity and the

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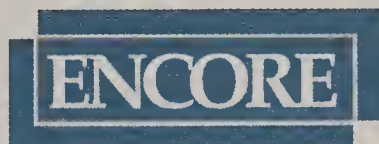
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BOOK EXCERPT: WHAT WILL BE

automobile. Earnings increased and a new class of white-collar workers emerged who were better educated and richer. They also became more mobile; but they faced unemployment and huge wage imbalances between classes.

what will its people and machines do?

I remember spending nearly every Sunday as a boy in the Athens flea market, with its bustling narrow streets packed with people selling, buying and trading every conceivable kind of good.

authority; all the participants controlled their own pursuits. It seems natural and inevitable to me that the future world of computers and networks would function like that flea market—an “information marketplace”—only instead of physical goods, the commodities would be information. That concept is a clean way to envision what the information age will be, both physically and functionally.

It seems natural *and inevitable to me that the future world of computers and networks would function like a flea market.*

Today's Information Revolution will trigger a similarly sweeping transformation. But what will be its “factories,” and

The people there formed a community that stretched beyond its commercial underpinnings. There was no central

I define the Information Marketplace as a collection of people, computers, communications, software and services that will be engaged in the intraorganizational and interpersonal informational transactions of the future. These transactions

Michael Dertouzos:
*from the flea markets
of Athens to today's
Information Marketplace*



APPLICATION FORM



The 1998 CIO Enterprise Value Awards

*Honoring Business Achievement Through The
Innovative Use of Information Technology*

APPLICATION DEADLINE: JULY 1, 1997

Presented By:
CIO Communications, Inc.



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The 1998 Enterprise Value Awards^s

CRITERIA

A panel of independent judges will choose winners from among entrants who have submitted completed application forms to *CIO* by July 1, 1997.

Entries will be judged on the following criteria:

- The extent to which the system adds business value in furthering the organization's strategic or operational objectives
- The measurable financial return the system provides to the organization
- The extent to which IT was key in achieving the overall business solution—the "couldn't have done it without technology" factor
- The quality of collaboration between the business unit and IS organization that is achieved throughout the course of the project

Each finalist will be subject to an in-depth analysis of the nominated system (to be performed by *CIO* or its agents). That analysis, which may require a site visit, will be based on interviews with sponsoring executives and system users and will be designed to substantiate all claimed benefits. Notification of winners will occur in October 1997. *CIO* reserves the right to publish relevant cost and savings figures that establish the claimed ROI of the system; the willingness to divulge that information for publication is a condition of entry.

DEFINING VALUE

We invite applicants to consider the broadest possible spectrum of enterprise value. The following list of IT-enabled benefits is intended to help guide applicants' thinking:

- new, innovative and more productive ways of doing business
- revamped organizational structures or styles of performing the work of the enterprise
- the ability of the enterprise to enter a new market
- successful global operation or expansion
- transformation of the way the enterprise competes within its customary market or of the terms of competition within the market

- improvement of the enterprise's relationships with its external customers
- improvement of the enterprise's relationships with its own employees or among its functions (such as marketing, finance or human resources)
- the ability of the enterprise to compete more effectively by adding to the sum of its available knowledge assets
- leaner and more economical operations

ENTRY GUIDELINES

- The system must have been operational prior to July 1, 1995.
- Entrants must agree to be featured, along with their systems and organizations, in a *CIO* article.
- Entries must be complete.
- The application form may be reproduced.
- Multiple entries from one company will be considered, but each entry must be submitted separately.
- Entries must be made jointly by the IS executive *and* the business sponsor for whom the system delivers value.
- IT vendors, public relations and advertising companies, consultants and other third parties may *not* apply on behalf of another company. They are encouraged to forward this form to the "owner" of the system or to contact *CIO* Communications to recommend that an application form be sent to the client.
- All entries must be computer-generated or typed; no handwritten entries will be accepted.
- Entries must be on 8.5-by-11-inch paper, one side per sheet.
- When feasible, an additional copy of the entry should be sent on a 3.5-inch disk. Electronic entries must be limited to word-processing and spreadsheet packages that are compatible with Microsoft Word and Microsoft Excel on a Windows or Macintosh platform.
- To view a complete sample application, or for more information on the Enterprise Value Awards, please visit our Web site at <http://www.cio.com/forums/EVA.html>.

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POSITIONING IT AS A BUSINESS ASSET

Yet the *CIO* Enterprise Value Award goes beyond recognition. It is an opportunity to provide hard, tangible facts about business value and ROI from information technology to the business community at large. It is an opportunity to demonstrate how partnering between business and technology executives can lead to the attainment of strategic objectives. By communicating the payback, *CIO* hopes to encourage other businesses to invest wisely in IT to ensure their survival in a fiercely competitive global market.

DO YOU QUALIFY FOR AN ENTERPRISE VALUE AWARD?

Four criteria are essential.

1. A return of value to the enterprise
2. A measurable financial return attributable to the system
3. The pervasiveness of information technology — in other words, the strategic objective could not have been met without IT's contribution
4. A collaboration between an IT and business executive

CIO ENTERPRISE VALUE AWARDS TIMELINE

APPLICATION DUE: July 1, 1997

JUDGES SELECT WINNERS: October 1997

WINNERS ANNOUNCED: October 1997

AWARDS CEREMONY: February 1998
*at the CIO Enterprise Value Retreat
Ritz-Carlton, Laguna Niguel, Calif.*

*1996 winners from
United HealthCare Corp.*



IF YOUR INNOVATIVE SOLUTION meets the criteria, please complete this Enterprise Value Awards application form. The Feb. 1, 1998, issue of *CIO* will feature profiles of the winning organizations and the executives who have proved that their technology investments have had a positive and sustained impact on enterprise value.

IN FEBRUARY 1998, *CIO* will host a special awards ceremony honoring the Enterprise Value Award winners at the annual *CIO* Enterprise Value Retreat. For more information, please contact Lisa Kerber at (508) 935-4449.



1. COMPANY/BUSINESS UNIT

name of parent company

city, state where headquarters are located

publicly or privately held?

annual revenues

industry

name of business unit or organization

city, state where located

number of employees at business unit

URL

2. ENTRANTS

A. name of entering IS executive / system sponsor

title

name of division, department or unit

address

city

state

zip

telephone

fax

e-mail

B. name of entering business-unit executive / sponsor

title

name of division, department or unit

address

city

state

zip

telephone

fax

e-mail

3. SUPPORTERS

Please list four people who are willing to be interviewed with regard to the system, its development, its use and the value returned. At least one should be a member of the technology team that developed the system and should have played a significant role. At least one should be a primary user from the sponsoring business unit. The other two may be from either organization or represent suppliers, customers or others intimately familiar with the system.

A.

name

title

telephone

fax

e-mail

reason for inclusion

B.

name

title

telephone

fax

e-mail

reason for inclusion

C.

name

title

telephone

fax

e-mail

reason for inclusion

D.

name

title

telephone

fax

e-mail

reason for inclusion

DEADLINE: JULY 1, 1997

Mail to: Enterprise Value Awards • CIO Communications, Inc.
492 Old Connecticut Path • P.O. Box 9208 • Framingham, MA 01701-9208

4. THE NOMINATED ORGANIZATION

Please tell us about your organization (*company, business unit, agency*) in 500 words or less. Include information on:

- when the organization was founded
- mission statement
- major products and services
- markets served
- your organization's standing within its industry
- any other data you believe to be relevant in terms of general background

5. THE NOMINATED SYSTEM

Tell us about the nominated system and demonstrate its importance to your organization by completing the following sections. Please limit your material to one page.

System Description: In one sentence or less, describe the system or IT initiative you are nominating (e.g., order-entry or document-management system; switch to a client/server architecture; global network implementation).

Technical Profile: Briefly describe the technology of the nominated system. Please include the names of major vendors and products. (NOTE: The examples provided here are meant to be illustrative, not all-inclusive.)

- Architecture (e.g., *client/server, mainframe*)
- Hardware (e.g., *mainframe/parallel processor, mini-computer/server, PCs, handheld devices*)
- Software (e.g., *operating systems, database system, application software*)
- Software development tools (e.g., *CASE, 4GLs, GUI developers, object-oriented development tools*)
- Network/communications hardware, software and services (e.g., *modems, routers, e-mail packages, carriers and public networks*)

6. BUSINESS IMPACT

Describe the primary business objectives of and value delivered by the IT investment. Please limit this section to three pages.

Statement of Value: List the three most important contributions the system has made to the business (please refer to "Defining Value" section on the first page of the application form).

Business Value Description: In detail, describe how the system delivers the value identified above (please include supporting data). Also describe any added value delivered, whether intentionally sought or serendipitously encountered.

Scope and Impact: Identify the functions (e.g., customer service, manufacturing, planning) that were changed by the system, the nature of those changes and their impact on the business. Also indicate the system's uniqueness compared with solutions being deployed by other companies within your industry.

The Importance of IT: Identify the different components of the overall business change (e.g., business reengineering, downsizing, cycle times). Explain the importance of the IT component to the overall business change. Could the results have been achieved without IT?

Collaboration: Describe how the business unit and IS organization worked together throughout the project, from conceptualization to implementation. What were the specific tasks fulfilled by the business unit? The IS organization?

7. QUANTIFYING ROI

Provide a detailed, one-page summary of the nominated system's investment costs (including all upfront development expenses and annual maintenance charges). Also provide estimates of returns (including increased profits, reduced costs and indirect cost-avoidance). Estimates of costs and returns should be made per annum over a five-year period. This data is required to make it past the first round of judging. If your company is selected as a finalist, you will be required at that time to fill out a standardized table detailing specific costs and returns.

8. TRUTH OF INFORMATION/RELEASE

The following release must be signed by both nominating executives if the application is to be considered.
Unsigned releases will invalidate the entry.

I hereby state that the information provided is true and complete to the best of my knowledge and belief.

I authorize the release and use of, in connection with the Enterprise Value Awards program, any and all materials furnished by me or others at the company contacted for this judging. I understand that information submitted on this application or subsequently gathered during the evaluation and judging process may be used in articles or any other type of publicity relating to the Enterprise Value Awards program.

I also authorize the release and use of my name, my company's name and my likeness, including but not limited to any photographs and any recording of my voice or image that may be taken of me for CIO Magazine. I agree that no compensation shall be due me or my company for such usage.

I recognize that failure to meet these conditions or to provide sufficient material that can be published can cause the application to be rejected at any point in the process at the sole discretion of the sponsors.

1. *signature of nominating IS executive* *date*
2. *signature of nominating business executive* *date*

9. OTHER EDITORIAL OPPORTUNITIES

If you are not selected as an award recipient, are you willing to be contacted for inclusion in other articles in CIO Magazine?

- ☐ Yes ☐ No

How did you learn about the Enterprise Value Awards program?

- ☐ CIO Magazine ☐ Academician ☐ cio.com Web site
☐ Consultant ☐ IS staff member ☐ PR Agency
☐ Systems Integrator ☐ Other publications ☐ Other
☐ Vendor ☐ Advertising Agency (please identify)

CHECKLIST

Have you filled out...?

- ☐ Company/Business-Unit, Entrants and Supporters Information

Have you included on separate pages...?

- ☐ Nominated Organization
☐ Nominated System
☐ Business Impact
☐ Quantifying ROI

Have both entrants signed and dated...?

- ☐ Truth of Information/Release

Have you checked off...?

- ☐ Other Editorial Opportunities
☐ How you learned about the Enterprise Value Awards program?

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*Vice President—Information Systems
Business Systems*

BRUCE S. GORDON
*Group President
Consumer & Small Business Services*

The Chase Manhattan Corp.

DENIS O'LEARY
Executive Vice President & CIO

FRANK LOURENSO
*Executive Vice President
Middle Market Banking Group (MMBG)*

Fidelity Investments

ALBERT AIELLO
*CIO
President, Fidelity Investments Systems Co.*

STEVE AKIN
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Fidelity Retail Customer Services*

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JIM SLOANE
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- How does annual revenue and size of company affect Internet policy making and procedures? Are different industries doing different things?
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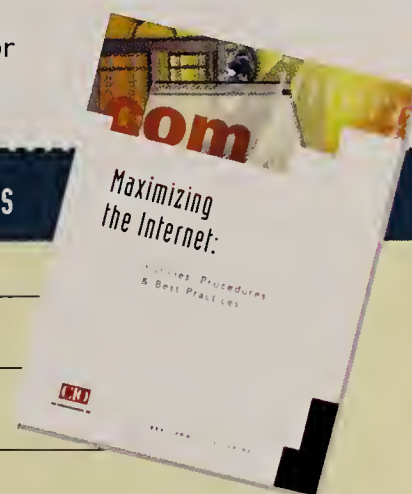
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will involve the processing and communication of information under the same economic motives that drive today's traditional marketplace for material goods and services. The Information Marketplace already exists in embryonic form. I expect it to grow at a rapid rate and to affect us as significantly as have the products and processes of the Industrial Revolution.

BUSINESS AND ORGANIZATIONS

Pan-Organizational Changes

The Information Marketplace will also increase the prospects for forming virtual alliances across hierarchical lines within an organization, with its suppliers and customers, and between sister organizations. We might reflexively assume that organizations will therefore become flatter and that all the distributed intelligence will

or over the phone don virtual-reality goggles and suddenly become cooperative team workers of the future? Will it be the novelty of it all? It's doubtful. Sooner or later the novelty of a new technology fades, and what survives within an organization is based on more fundamental factors of utility.

Human emotions and foibles have a huge effect on all professional exchanges within an organization. Solid bonds or rifts among employees, the boss's mood, motivation (or lack thereof) to achieve goals, passion, greed, jealousy and altruism are all at play in any human organization. Can the Information Marketplace pass those intangible human factors that so profoundly influence our decisions and actions? And can it steer them to the good? Not by itself and not unless people want it to. And even if the people are willing to use their new machinery toward these good purposes, some human forces simply cannot pass through the Information Marketplace. Thus the Information Marketplace must be supported with all the traditional methods for building human bonds, including

and village identities.

It's often said that the companies of the information age will have fewer people, that workers' voices will be heard more easily in the executive suite and that teams of people will be easier to pull together and disband. Indeed, it is even said, with some breathlessness, that people will be able to assemble a company overnight across the globe, carry out the purpose for which it was assembled, then disassemble it just as quickly.

It is certainly possible that organizations will have fewer people, especially since automatization is likely to increase human productivity. But the notion of instant corporations is harder to swallow because a great deal of a group's power rests in its people and especially in the relationships among them. Relationships cannot develop instantly even if the mechanics of getting people together can. If there is any chance for instant organizations, they will have to be formed among people who already know each other, as with old friends who have built trust over many years and can reach momentous decisions in brief telephone

Another probable organizational development is the evolution of "expert centers" staffed by groups of experts capable of high-quality, high-speed work at very competitive prices.

conquer even the most difficult organizational problems because of the informality of the medium and the richness with which it can connect human resources.

Yet we should temper our optimism with the scary observation that organizations have had telephones for a century and that anyone could have picked up the phone and formed these alliances long ago. Some organizations may always be stifled by the isolation their corporate cultures breed. Faced with problems in manufacturing in the 1980s, managers of U.S. automobile plants sent memos up and down the chain of command, resulting in huge manufacturing delays of 2 to 1 compared with Japanese manufacturers, who met in teams across hierarchical lines. What will make an organization's employees who have not elected to team up with others in person

face-to-face, real-life experiences, if it is to serve organizations as more than a high-tech postal system.

The Information Marketplace will undoubtedly alter the familiar organizational terrain in other ways that are harder to predict. Perhaps remote work from our homes will become so prevalent that the whole balance between cities and suburbs will be disturbed. As William J. Mitchell, dean of MIT's School of Architecture and Planning, points out in *City of Bits*, such a transition would call for a shift of the physical workplace from the office to the home, an increase in restaurants and other personal services in the suburbs and a corresponding decrease of the same services in the city. That demographic shift may also create a new breed of citizens, split between their city

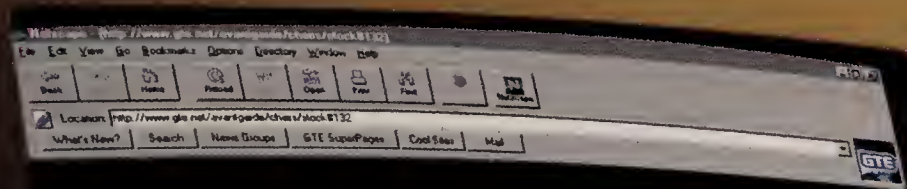
conversations. Instant task forces within existing organizations will happen. Instant organizations of people who have never met their peers, let alone built some mutual trust, won't work.

Another probable organizational development is the evolution of "expert centers" staffed by groups of experts capable of high-quality, high-speed work at very competitive prices. Instead of only using their voices, as is the case with many of today's call centers, those people will have access to all the resources and tools of the Information Marketplace. In some cases, the experts will reside in one physical location, but the people comprising most centers will be distributed throughout the world. Yet they



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BOOK EXCERPT: WHAT WILL BE

will present a single, local organizational face to anyone who contacts them. We can imagine lawyers from different countries forming a center that specializes in international law. Personal and financial advice centers, medical diagnosis centers, how-to centers, purchase collaboratives and many other expert

from the large corporate centers to local communities, that does not automatically mean it will move into our homes. Work centers would be physical facilities in our bedroom communities where we gather to do our jobs. These co-ops or intermediary organizations would have high-quality, high-bandwidth links to the

environment with other workers, which people seem to like and even need. With these new entities in place, employment may ultimately become a mix of old-fashioned work at the company, work at a local work center and work at home. Once again, we see the Information Marketplace pulling against the move to

The Information Marketplace *will also have a very big impact on workers who, for whatever reason, can't get to where the jobs are.*

groups will emerge too, creating new alliances across the world. The fundamental economic force behind these truly new organizational entities will be the delivery of greater expertise at costs lower than was possible in the pre-Information Marketplace era.

We may also witness the rise of work centers, whose demographic effects would run counter to full decentralization. Though work may move away

Information Marketplace, sophisticated groupwork software and all kinds of human machine interfaces like hyper-secretaries, cafeterias and other office-related amenities, even day-care facilities. Workers from different companies as well as those who are self-employed would go there to work. In addition to offering a wealth of office services, the centers would provide separation from the home and its distractions and a social

the cities that was caused by the Industrial Revolution as people swing back toward the rural communities in search of healthier, less expensive places to live, away from pollution, crime and other ills of the world's largest cities.

The Information Marketplace will also have a very big impact on workers who, for whatever reason, can't get to where the jobs are. Its space- and time-bridging effects will allow the disabled,

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BOOK EXCERPT: WHAT WILL BE

the homebound, parents of young children and others to produce results that are indistinguishable from those produced by employees who can actually come to the office full time. The Information Marketplace will do much to erase any practical basis for the reluctance many employers now feel toward hiring people who don't fit their standard employee profiles. The new legitimacy of homebound and part-time workers will also enlarge the pool of

preoccupation with knowledge carries a belief that something loftier and much more valuable than the information itself is at play, which, if captured, will place an organization ahead of its competitors. What hype!

Since time immemorial, knowledge has been a key component of all human activity and certainly of all business activity. And as every student of best practices knows, the world's top corporations are characterized by knowl-

If a company is to compete effectively in the new world of information, all of its employees must feel comfortable exploiting whichever aspect of the Information Marketplace helps them carry out their work better—from buying paper clips to setting the stage for merger negotiations.

We have had CEOs, CFOs, COOs and CIOs because those activities have traditionally been centralized. By contrast, the use of the Information Marketplace is

If a company is to compete effectively in the new world of information, all of its employees must feel comfortable exploiting whichever aspect of the Information Marketplace helps them carry out their work better.

potential employees and expand the job market for people whose employment opportunities will no longer be restricted to the area they live in. Thus the Information Marketplace will level differences in employment and unemployment across regions and even nations.

For the handicapped, the potential benefits do not stop there. Already in Europe there is a large database called Handynet that documents the various aids available for people with different disabilities. Other matching and referral services are sure to arise. Moreover, bringing the handicapped into the ranks of productive workers benefits not only the economy but our society at large as they fulfill their human desire to feel needed, useful and equal to their peers. The Information Marketplace may be the healing force that removes the "handicapped" distinction from the organizational vocabulary.

The increasing use of such terms as "chief knowledge officer" and "knowledge capital" signify the importance that corporate America is beginning to place on the role of information. But is there a difference between information and knowledge? In a practical sense for most organizations, there isn't. Knowledge is any use of information that helps the organization. But for most futurologists, their

edgeable employees who are aware of the broader corporate goals and issues and who know intimately the immediate business matters that surround them, whether they are in sales, marketing, engineering, administration or research. I cannot help but recollect the "knowledge assets" of a Greek friend, a shipping tycoon today, who wasn't always so wealthy. He had bought two of the shallowest draft ships in the world, all he could afford at the time. When he got a request for a cargo shipment to or from a shallow harbor, he would first check to see where his competitors' shallow draft boats were. If they were available, he would bid low. If they were not, and the client were in a hurry, he would bid three times as high, knowing that his was the only game in town. The clients were incredulous at these fluctuations but they had no alternative. Conquered by knowledge, they paid up.

"Knowledge" is not a few selected jewels kept in a safe and managed by a specific individual. It is myriad tricks, routine procedures, facts, contacts and other nuggets that are possessed by every single employee from clerk to CEO, at every location every time the company does business. It's ubiquitous, like air and water, or perhaps like reading and writing and remembering. Every employee needs those things to function. So where is the company's chief air, water, reading and writing officer?

most effective when it is fully distributed. Now, if a knowledge officer is the person who will help educate a company's employees or who will focus on what employees can do to better exploit the Information Marketplace, then I wholeheartedly approve of the position.

But regardless of whether chief knowledge officers become common as the Information Marketplace blossoms, it's a sure bet that CIOs and their IS teams will continue to be around. At one time, these specialists were the only ones dealing with information and its processing. With the changes ahead, where almost every business employee will be dealing with information, the question arises: What might these IS people do? They should manage the company's shared information resources—the common data and procedures that everyone needs and the organization's shared infrastructure tools. For example, they should help establish e-forms within their own organizations, which should be easier than establishing e-forms between organizations. Tomorrow's IS team will handle a smaller fraction of the organization's total information activities than its ancestor—today's IS team—since so many more people within the organization will be using the Information Marketplace directly to carry out their work. **CIO**

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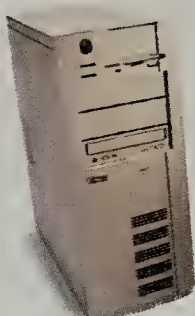


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NOTES FROM THE FIELD

Case in Point

Participants at CIO's recent Enterprise Value Retreat advised a successful family business how to stay competitive

BY TOM FIELD

SOUTHWIRE CO. IS A FAMILY operation. Founded in 1950 by Roy Richards in his hometown of Carrollton, Ga., the company began as a privately funded electrical-wire manufacturer. Within two years, Southwire grew from 12 employees to 22 and shipped 5 million pounds of wire representing \$560,000 in sales. In just over three decades, Southwire had become a \$500-million-per-year operation with five major lines of business and was well established as a leading U.S. producer of aluminum and copper rod, wire and cable for the con-

struction and utility industries.

But when Richards died in 1985, his son, 26-year-old Roy Jr., found himself running a business beset with challenges. Material costs and interest rates were up, and sales were down. Still, by increasing and streamlining production and practicing total quality management, Roy Jr. was able to turn Southwire into a \$1.9 billion business in a decade.

By 1996, Southwire was a U.S. market leader—its sales easily surpassed those of its domestic competitors—but the market was projected to grow by

only 2 percent per year, and even that slim margin offered enough space to let in an increasing number of foreign competitors. Company executives decided that for Southwire to continue to grow and prosper, it had to diversify its products, modernize its internal systems and tackle foreign competition head-on by expanding into new global markets.

Yet achieving those goals would require a massive investment in information technology, moving the company from a centralized, mainframe IT platform to distributed, open systems. How could Southwire support that investment, manage the cultural changes that come with new technologies and still deliver shareholder value?

That is the quandary that faced attendees of the fifth annual CIO Enterprise Value Retreat (EVR), held Feb. 2-5 at the Ritz-Carlton Laguna Niguel in Dana Point, Calif. With Richards and other members of Southwire's senior management team present, retreat participants broke into dis-

cussion groups to brainstorm about the Southwire dilemma and offer advice to the company's management team.

To prepare for their discussions, attendees spent the better part of a day with retreat moderator F. Warren McFarlan, senior associate dean, director of external relations and Ross Graham Walker professor of business administration at Harvard Business School. McFarlan discussed the critical—and increasingly complex—role of IT in organizational transformation in the late '90s and presented a grid dividing companies



Warren McFarlan (inset) addressed participants at the Enterprise Value Retreat, held at the Ritz-Carlton Laguna Niguel in Dana Point, Calif.



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into four groups: factory, strategic, support and turnaround. The category into which a company falls indicates the strategic value of IT for the organization, which can help it decide how to manage its information resources (see "Assessing the Strategic Value of IT," this page).

McFarlan's grid was a hot topic in the breakout groups, which were made up of people from the EVR roster of IS professionals, business executives, vendors and consultants. One group included Southwire's field sales manager, Michael K. Ashworth, who shed his partisan interest and took up a black marker to take notes and help facilitate the discussion.

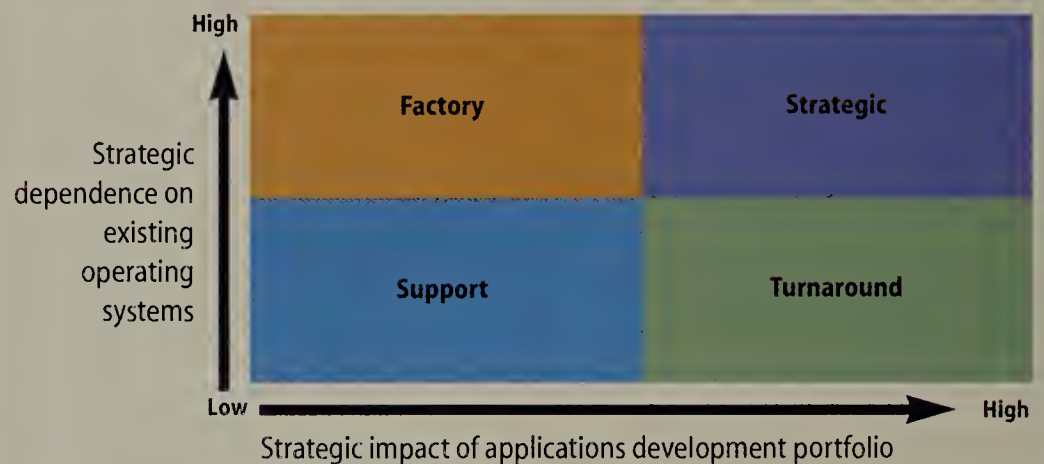
Before deciding where Southwire belonged on the grid, Ashworth's group drew from the written Southwire case study to size up the company's state of IT using the so-called SWOT approach—strengths, weaknesses, opportunities and threats. Among the findings, which Ashworth posted for the group, were the following:

- **Strengths:** Enough money to spend on IT; senior buy-in to strategic initiatives; proven process innovation; strong commitment to keeping up with technology advances.

- **Weaknesses:** Lack of international skills and experience; lack of a clear plan for managing planned changes; predominantly senior staff who might not be familiar with new technologies; lack of external benchmarking; perceived lack of buy-in to strategic initiatives by middle management and users.

- **Opportunities:** Promoting international growth; redefining customer/supplier integration; developing and benefiting from a new data warehouse; aligning IS and business strategies more closely.

Assessing the Strategic Value of IT



- **Factory:** Businesses in this quadrant use IT, but the applications are not fundamental to the companies' competitive stance. The cost of downtime is high, though; even a one-hour service disruption can have severe consequences.
Example: manufacturers

- **Support:** IT has little strategic impact on companies in this quadrant. New application development is limited, and if systems crash, the companies can continue to operate.
Example: professional services businesses

- **Strategic:** Here, IT is vital to day-to-day operations and competitiveness. These businesses require high-level IT management and planning.
Example: banks, retail chains

- **Turnaround:** Companies in this quadrant rely on IT support for operations but are not dependent upon uninterrupted service. Applications under development at these organizations likely are vital to achieving new strategic business objectives.
Example: global manufacturers

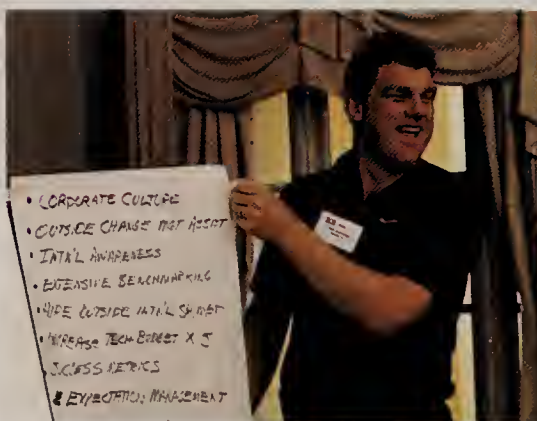
"There's no one right way to plan, organize and implement technology. The best way depends on where the company lies on the grid."

—Warren McFarlan

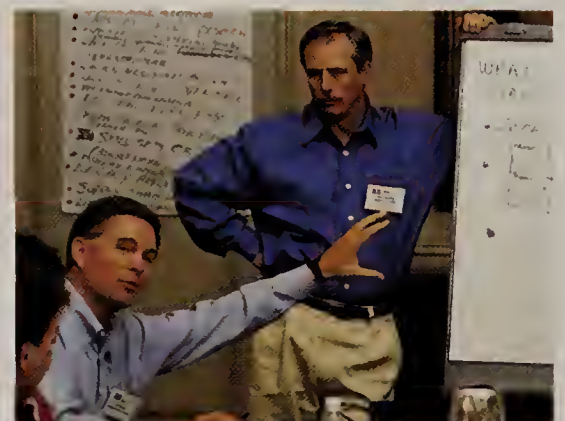
ADAPTED WITH PERMISSION OF THE AUTHOR FROM *CORPORATE INFORMATION SYSTEMS MANAGEMENT* BY LYNDA M. APPELGADE, F. WARREN MCFARLAN AND JAMES L. MCKENNY (IRWIN, 1996)



Lee Hunter, Southwire's vice president of environmental and technical support, dropped in on a breakout session to answer questions.



Novell's **John Ironmonger** said of Southwire: "They've built the car; now they've got to drive it on the racetrack."



Southwire field sales manager **Michael Ashworth** manned the flip chart as Hewlett-Packard's **Jim Sherriff** made a point.

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■ **Threats:** Lack of organizational buy-in; international competitors; dwindling domestic market growth.

At one point during the discussion, the "weaknesses" started to eclipse the "strengths." Madeline Weiss, president of Weiss Associates Inc., a Bethesda, Md.-based consultancy, commented to Ashworth, "It must be so hard to hear all this."

"Oh, no. We welcome this," Ashworth said. "We've got all the expertise in the world assembled right here, and we want to take advantage of it."

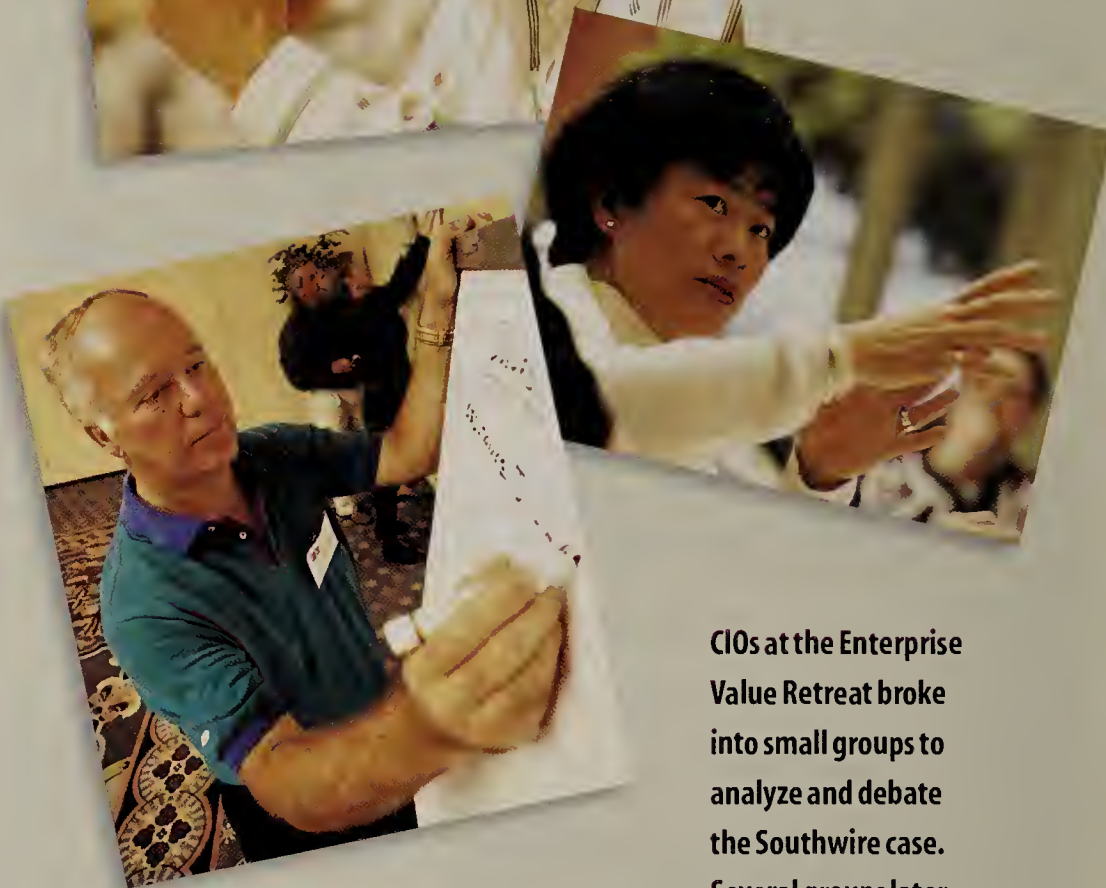
There was little disagreement during the SWOT talk, but differences emerged as the group considered where Southwire fell in McFarlan's grid. Some, like William E. Lyons, systems and technology manager at Finance One Corp. in Columbus, Ohio, maintained that Southwire exists in a factory mode and must now move to strategic; others, such as Lynn Jacobs, CIO of DreamWorks SKG of Playa Vista, Calif., saw the company headed toward turnaround. "They're not ready for prime time in strategic," she said.

John Ironmonger, director of network services for Novell Inc., based in Orem, Utah, leaned toward support but then abandoned the quadrants entirely and created his own analogy. "They've built the car; now they've got to start driving it on the racetrack," he said.

The discussion heated up, with no conclusion in sight. "This is taking on the characteristics of a religious discussion," warned Tom Walker, CIO of DecisionOne Corp. in Frazer, Pa. Jim Sherriff, general manager of Hewlett-Packard Co.'s Mountain View, Calif.-based Worldwide Professional Services Organization, suggested that the group abandon the quadrants and concentrate instead on offering recommendations to Southwire. In the end, the recommendations were broken down into three categories—organizational, IT and market-share change—and the group made the following suggestions:

■ **Organizational change:** Clearly articulate a corporate vision for international expansion; get outside help in developing a comprehensive change-management plan, including rewards, incentives and consequences.

■ **IT change:** Increase the IT budget; mi-



CIOs at the Enterprise Value Retreat broke into small groups to analyze and debate the Southwire case. Several groups later presented their advice to the company at a general session of the conference.



EVR participants had ample opportunity to network between conference activities.



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CIO Communications Inc.'s fifth annual Enterprise Value Retreat at the Ritz-Carlton Laguna Niguel in Dana Point, Calif., brought together more than 200 CIOs and leaders from Fortune 1000 and government organizations to examine the dramatically changing structure of the IT environment in the late '90s. The Enterprise Value Awards ceremony and dinner honored recipients for their achievements in demonstrating enterprise-wide IT benefits.

grate/integrate legacy systems to new technologies such as the Internet and data warehouses; explore linking systems to customers and suppliers.

■ **Market-share change:** Bring international expertise into the organization; explore new markets; look at ways to maximize service through customer segmentation.

At the end of the three-hour Southwire discussion, Sherriff was appointed to prepare a presentation of the group's findings, should the group be called upon to present its recommendations to all EVR attendees the next day. And as it happened, the group *was* one of four asked to state its case. Sherriff, whose company is a leading global manufacturer of printing technologies, made light of his hand-scrawled overhead slides as he relayed the group's recommendations to a panel of Southwire representatives, which included Ashworth, Richards and Lee Hunter, vice president of environmental and technical support.

The four groups' baseline recommendations were essentially the same. Each group hit on the same core issues: Southwire should explore new markets and new technologies; the company needs outside support to plot its new course; managers must develop an effective change management strategy.

The Southwire representatives nodded appreciatively. Asked what they got from such a public airing of their IT laundry, Hunter replied, "Reinforcement. You have reinforced the issue of change management at Southwire as well as the ongoing challenge of globalization—that's one of the issues that keeps me awake at night."

Musing on the challenges that must be met if he is to carry his family's 20th century industrial legacy into the 21st century, Richards concluded, "All this stuff we're working on—we're just making it up as we go along. There is no road map.... It's great for us to hear from the outside what we're doing right, what we're doing wrong."

Whether Richards can apply EVR attendees' advice to help Southwire take advantage of IT and leap successfully into the global marketplace is an issue for a future case study—and perhaps a future EVR group—to decide. **CIO**

Staff Writer Tom Field can be reached via e-mail at tfield@cio.com.

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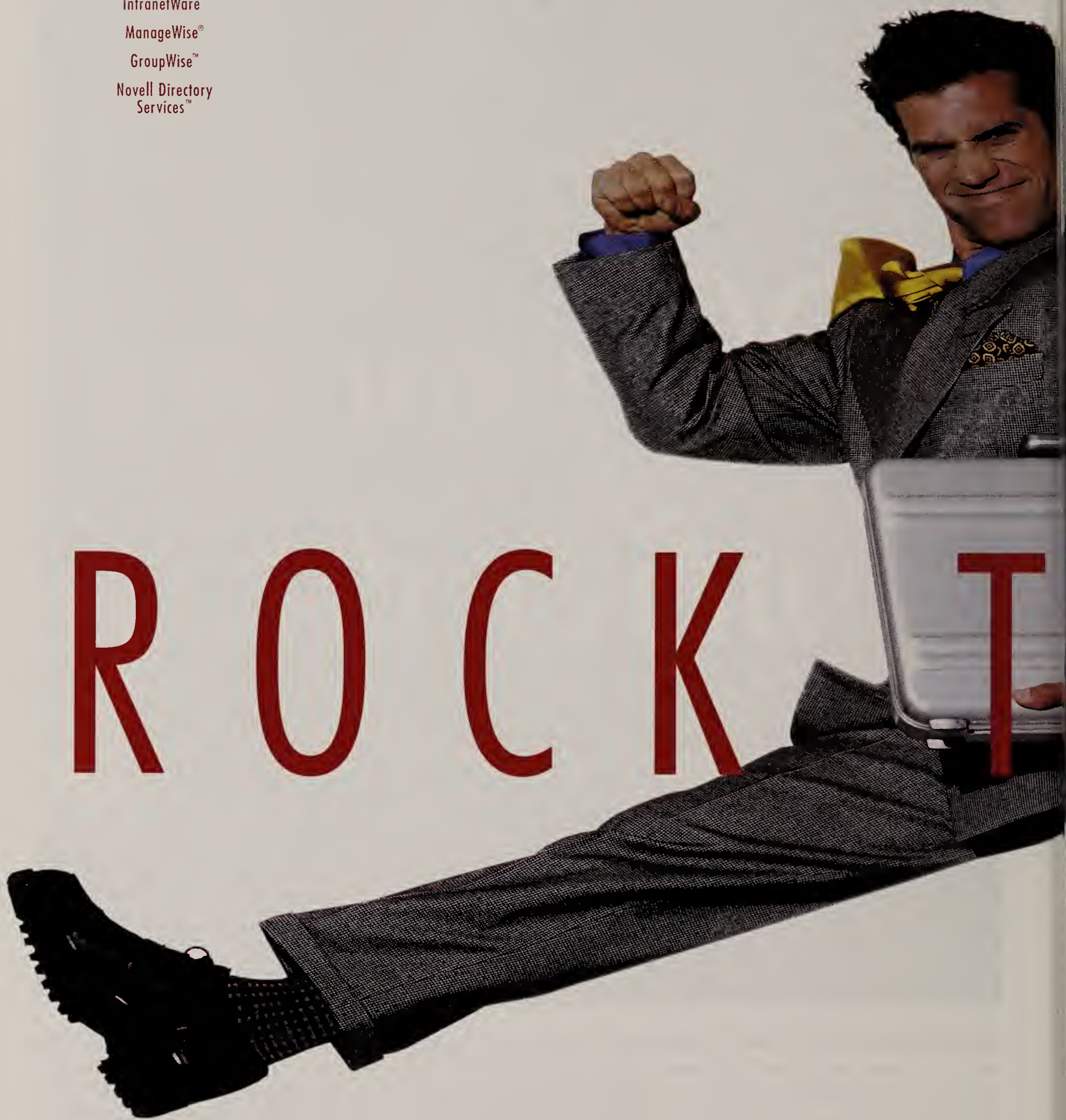
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Edited by Elaine M. Cummings

Is ISDN Soup Yet?

High-speed data transfer technology comes of age

BY JOHN EDWARDS

AFTER YEARS OF FITFUL PROGRESS, ISDN is finally finding some measurable market acceptance—just in time to run into serious competition from an array of upstart data communications technologies.

Conceived in the 1980s, Integrated Services Digital Network was a technology designed to give home workers, small businesses, local store branches and geographically dispersed departments and workgroups a taste of the high-speed data transfer capabilities enjoyed by major corporations. For many years, ISDN's promise wasn't strong enough to overcome a series of real-world roadblocks, including limited service availability, installation headaches and an unacceptably high cost for customers accustomed to untimed local calls on analog modems. But many of ISDN's problems have been solved over the past few years as regional Bell operating companies (RBOCs) have expanded their service coverage and sharpened their marketing strategies. With local telephone deregulation, communications giants like AT&T Corp., MCI Telecommunications Corp. and Sprint Communications Co. LP have also launched ISDN service efforts.

According to research from International Data Corp., a sister company of CIO Communications Inc., publisher of *CIO*, about 500,000 ISDN lines are installed nationwide, and that figure is predicted to increase ninefold by 2000. ISDN's time has arrived, says Dick Slezak, AT&T's managing director of global ISDN in Bedminster, N.J. "In the days before the Internet and widespread telecommuting, few home or business customers had the need for ISDN's high speed," Slezak says. "Today, people are turning to ISDN to give them the speed they need to connect with the Internet and office networks."

ISDN is available in two flavors: Basic Rate Interface (BRI) and Pri-



mary Rate Interface (PRI). With BRI, customers receive three digital channels. One is used to handle control and signal information, such as phone numbers and bandwidth data. The other channels can each carry voice, faxes or data at up to 64Kbps or can be merged into a single 128Kbps line. PRI customers can take advantage of 23 or 30 channels allowing data transfers at 1.544Mbps or 2.048Mbps, respectively. PRI is significantly more expensive than BRI service and thus out of the reach of most home or small business.

Although recent improvements have made the technology easier to understand and implement, ISDN still makes substantial demands of its users, says Richard Benwell, a Digital Equipment Corp. network products manager based in Reading, England. "ISDN isn't exactly plug-and-play technology," he says. "Prospective users need to be familiar with the technology and must be willing to work with the service provider, the modem maker and the Internet access provider to make sure that everything works together harmoniously."

Benwell adds that, despite recent service coverage expansions, many places in the United States still can't get ISDN. "Access isn't universal," he notes. "The unfortunate thing is that ISDN often isn't available to the people and businesses who need it most—those tucked away in isolated, rural areas."

In places where ISDN service is available, installation costs (not including the price of a modem) range from

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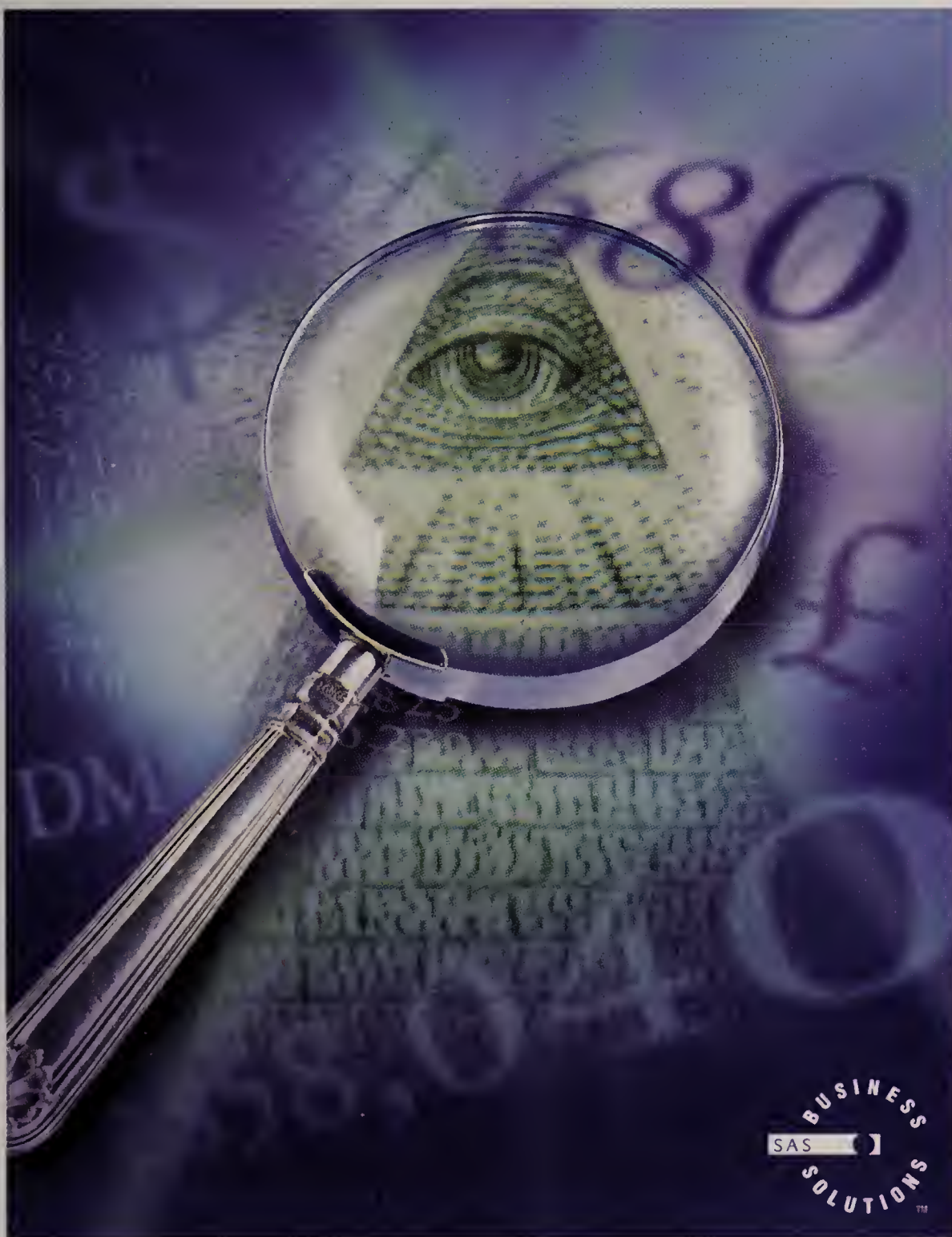
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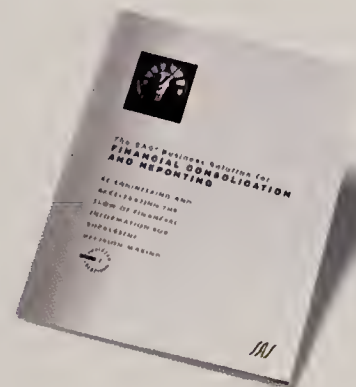
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Emerging Technology

about \$150 to \$300. Monthly access fees typically run from \$25 to \$50, plus per-minute charges of zero to 25 cents (depending on whether the connection is made during peak or nonpeak hours). ISDN modems, also known as terminal adapters, are generally priced from \$200 to \$400.

If one is lucky enough to be in an area with multiple ISDN providers, one can shop around for access on the basis of price and technical quality. Some ISDN providers don't offer BRI service at the full 64Kbps rate. Switching equipment limitations force Pacific Bell, for example, to limit the maximum throughput in some areas to 56Kbps per channel.

Linking to the Internet via BRI can also be more expensive than with an analog modem. Although many Internet access providers are bringing their ISDN fees closer to the "\$19.95 per month, unlimited time" deals available to analog modem subscribers, others continue to charge ISDN customers significantly higher access fees—\$30 to \$65 per month plus per-minute charges.

The 56K Challenge

Although ISDN has blossomed, several challengers loom on the horizon. The most immediate threat comes from new 56Kbps modems, which promise to provide near-BRI-class service without the complexity or extra cost. U.S. Robotics Access Corp. of Skokie, Ill., and Rockwell Semiconductor Systems of Newport Beach, Calif., have each developed 56Kbps modem technologies (called x2 and K56Plus, respectively) that work over standard telephone lines.

Both technologies take advantage of modern digital phone networks and digitally connected modem racks at the server end of the telephone network. The 56K modem is a useful solution for individuals and companies that want faster data communications but aren't ready to invest in ISDN, says Robert Bauer, vice president of marketing for U.S. Robotics Mobile Communications Corp. in Salt Lake City. "56K can very quickly meet users' near-term require-

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At Chrysler Corp. in Auburn Hills, Mich., customers soon will use the Web to design and order their "dream cars" equipped with the features, color and financing they require.

The common element in each transaction is interactive product configura-

tion, a new generation of sales technology that allows easy customization of complex products. Beyond sales force automation, which streamlines the sales process, configuration systems aim to better match a company's products with its customers' specific needs. Two prominent vendors in this emerging field are Calico Technology Inc. in San Jose, Calif. (www.calicotech.com) and Trilogy Development Group Inc. in Austin, Texas (www.trilogy.com).

Cisco's sales configuration is enabled by Concinity Configuration Engine, which, like an experienced sales rep, provides users with feedback on the selections they make. Concinity uses an object-oriented approach to develop models that describe how each product is configured, priced and quoted, and the relationship between options and how they solve user needs. The systems integrator tools provide developers and integrators with optional services, including application programming interface support, Microsoft OLE Automation, open database connectivity driver and an

enterprise resource planning (ERP) translator that enables customers to extract product data and business logic from ERP systems.

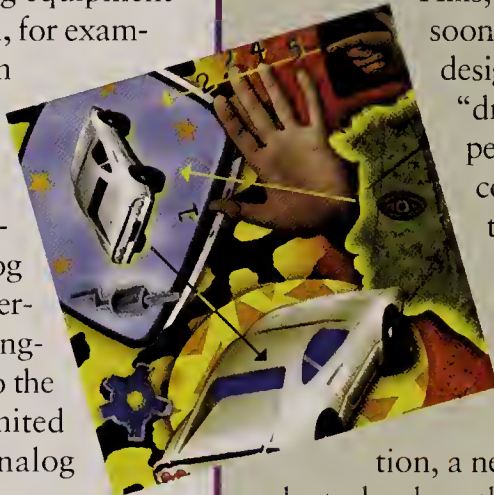
Concinity, which Cisco has used since 1995, has helped reduce the error rate on customer orders by 30 percent, according to vice president of IS and CIO Peter Solvik, who says Cisco recouped its investment in Concinity within a year.

PRODUCT CONFIGURATION

Chrysler's approach is refined by Trilogy's Selling Chain software, a client/server enterprise application suite that helps companies streamline front-office business processes and create direct links between customers and enterprisewide information systems. With a backbone that supports Microsoft's OLE, Selling Chain creates a consistent interface for product, pricing and market information while providing a real-time view into the sales pipeline of orders, requests and sales information. Selling Chain also integrates with ERP systems from such vendors as Oracle Corp., Baan International Inc. and SAP. At Chrysler, Selling Chain will be used to help customers shop for and design new cars via the Internet or at free-standing kiosks in dealer showrooms. By typing in their specific needs—color, monthly payment limits, safety features—customers will be able to get the car they want rather than settle for an available car that almost meets their needs.

Although the Web-enabled configuration option won't be available to customers until later this year, Chrysler officials say the new technology will revolutionize auto sales and production. Rather than base next month's production on last month's sales, Chrysler expects to build the cars customers want, when and where they want them.

—Tom Field

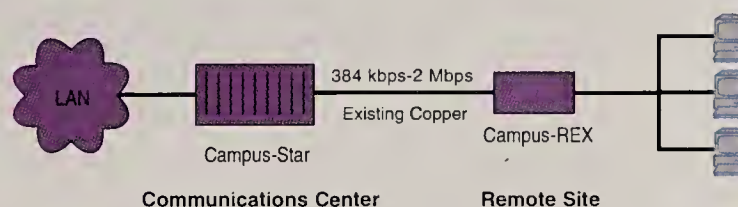


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Emerging Technology

ments for additional performance on the download," Bauer says. "In the future, users may adopt ISDN or other technologies as they become available or more affordable."

The first 56Kbps modems just began shipping in early 1997, and many experts have questioned whether the units will meet expectations for improved speed. James Watson, ISDN product manager of Ameritech Corp. in Chicago, says he doubts that most users will experience a level of performance even close to 56K throughput. "The reliance on analog-to-digital conversion and the fact that there won't be more than one such conversion [on a circuit] will impact the performance," Watson says. "I'm not sure that users are necessarily going to get 56K and, at any rate, it's only one-way." Watson also says he believes that 56K leads to a technological dead end. "We've squeezed all we're going to get out of an analog modem base, so you're not going to get anything better out of these fast modems," he says.

Both x2 and K56Plus modems are useful only if 56Kbps technology is available on both ends of the link. U.S. Robotics and Rockwell Semiconductor are both working with online services and Internet access providers to make sure the technologies can be used in the real world. Support is widespread but not universal, so potential adopters need to check for service availability before acquiring x2 and K56Plus products.

Waiting In The Wings

New 56Kbps modems aren't the only threat to ISDN. Asymmetrical Digital Subscriber Line (ADSL) technology is on the way, promising speed at least five times that of BRI. ADSL sends digital data over standard twisted-pair telephone lines, so the technology is attractive for users in houses or older office buildings.

ADSL service improves or degrades in relation to the user's distance from the phone company's central office. If the user is located close to a central office, it's possible to download at 9Mbps and upload at 640Kbps. If the user is on a circuit's fringe, however, the download speed could drop to as low as 1Mbps and the upload speed to no more than 16Kbps.

Unlike ISDN or 56Kbps modems, ADSL isn't even close to becoming widely available. "I'd say it's in the same place that ISDN was 10 years ago," says Paul Kraska, product marketing manager at modem maker Multi-Tech Systems Inc. of Mound View, Minn. But like ISDN a decade ago, ADSL has the power to spark the imagination of users, product vendors and service providers be-

LEADING

EDGE

Pushy, Pushy

EVERYTHING ON THE WEB has gotten so pushy lately, and now McAfee Associates Inc. in Santa Clara, Calif., is joining the crowd with its software distribution service, **SecureCast**. The network security vendor is teaming with Internet broadcasting software vendor BackWeb Technologies Inc. to use "push" technology to deliver McAfee's antivirus software applications and updates directly to user desktops via Web browsers.

SecureCast operates transparently in the background whenever a user is connected to the Internet and not actively downloading pages or files. As users read a Web page, SecureCast automatically downloads InfoPaks, which include new antivirus signature updates, news alerts, security advisories, white papers and technical notes. An icon then appears on the user's desktop indicating whether he should update the antivirus software. In the past, users had to manually download software from McAfee's Web browser to stay current with the 100 to 200 new computer viruses created each month.

Customers can subscribe to the SecureCast service by visiting McAfee's Web site at www.mcafee.com. To subscribe, customers can download the free SecureCast BackWeb client. Once installed, the client will automatically receive InfoPaks from McAfee's BackWeb server. Customers can specify how frequently they want to receive the InfoPaks. SecureCast agents will also be bundled in all retail boxes of McAfee's VirusScan for Windows 95 and PCCrypto. For more information, call 408 988-3832.

Search For Self-Analysis

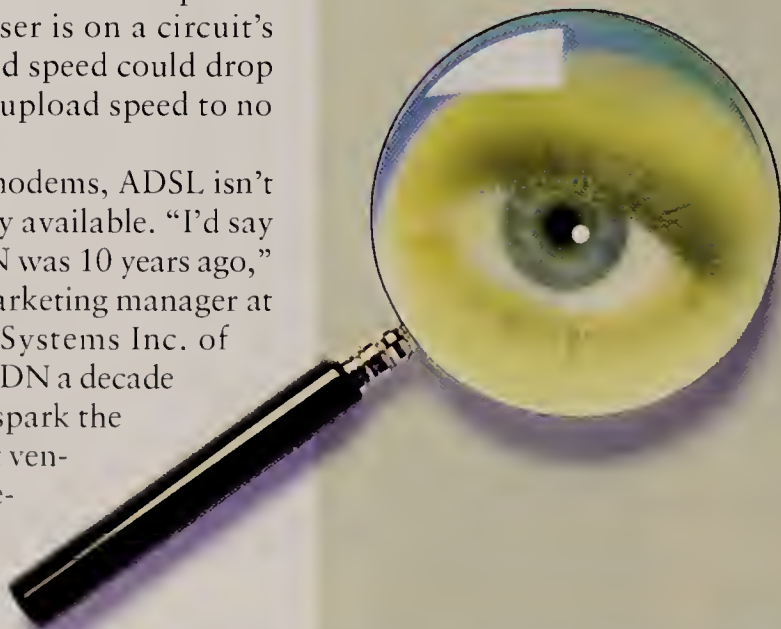
CORPORATIONS RELY ON ALL TYPES of information to stay current and competitive. But some industry analysts estimate that businesses analyze less than 7 percent of their in-house data.

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cause of the new applications, such as videoconferencing, that ADSL's speed will accommodate. "ADSL will offer all types of users unprecedented speed, opening the way to real-time videoconferencing and other advanced applications," says AT&T's Slezak.

Pacific Bell was the first communications provider to promise ADSL availability. The company is set to begin providing service this spring to customers in selected areas of California. Other companies are still in the testing phase. Ameritech and IBM Global Networks began a six-month trial in Wheaton, Ill., in October 1996. GTE Service Corp. last year launched a test project with approximately 200 employees in Irving, Texas. Bell Atlantic Corp. began a trial in northern Virginia in September 1996. Nynex Corp. is offering Internet access via ADSL to Lotus Development Corp. employees in Cambridge, Mass., while US West Inc. has a similar test project underway with Microsoft workers in Redmond, Wash.

O'Donnell says he thinks ADSL's high cost will keep it from overtaking ISDN in the foreseeable future. "ADSL's cost structure isn't yet set, but it's evident that the technology will be more expensive than ISDN," he says. "As a result, ISDN and ADSL will probably coexist, with ISDN cost-effectively serving people who don't need extremely high-speed data transfers and ADSL serving the market's high end."

Connecting to Cable

Still another challenger to ISDN is cable modem technology, which uses hybrid coaxial/fiber-optic cable TV lines to provide download speeds of up to 6Mbps—nearly four times as fast as a T1 line—and upload speeds of 640Kbps, five times BRI's top speed and equal to ADSL's. Proponents say cable modems may eventually allow users to download data at speeds greater than 10Mbps, surpassing the rate of Ethernets.

Numerous cable modem trials are underway, using products from Motorola Inc., Zenith Electronics Corp., Com21 Inc. and other vendors. In the Boston area, Continental Cablevision Inc., for example, is offering limited Internet access to about 220 homes. Time Warner Cable tested its Road Runner cable modem service in Ohio and New York state in 1996 and is currently conducting another trial in Portland, Maine.

But before cable modem technology can

catch fire, cable operators must overhaul their networks' hardware and cabling and upgrade the head end at each customer site. The total investment, including the \$400 to \$500 modem, can cost a cable provider upward of \$1,000 per site. So far, only 5 percent to 10 percent of U.S. homes are served by cable networks with two-way data communications capability, but the situation is changing rapidly. Forrester Research Inc. predicts that by 1998, 2 million people will be using cable modems and 4.5 million will be using ISDN. "The infrastructure still needs to be put into place, but it's being built very quickly," notes Ameritech's Watson, whose company began offering cable service in 20 Midwestern cities last year.

A unique drawback to cable modem technology is that while many homes are wired for cable, most offices are not. As a result, telecommuters and home-based businesses are better prepared to use cable modems than are commercial offices. But a more serious shortcoming lies in the way cable modems distribute data. Cable modems "broadcast" information in a sort of party-line arrangement. Encryption allows the modem to receive the essential data and ignore the rest of the clutter, but that can't keep the network from bogging down as traffic increases. "You get several hundred people on the network, and you'll wonder why you didn't get ISDN," says MCI's O'Donnell.

AT&T's Slezak says telecommunications is at a crossroads, meaning managers must use smart shopping techniques rather than psychic abilities. "Cable modems look good, but so do ISDN, ADSL and all the rest. Managers face an overwhelming array of choices, and it's difficult to foretell the future. I think the only thing one can do is to assess one's current needs and make the selection that makes the most sense."

Multi-Tech's Kraska agrees. "Make the choice that gets the job done now, and you won't have any regrets in the future," he notes. "All of these technologies will be around for many years, and you'll always have the chance to upgrade in the future." 

John Edwards is a freelance technology writer based in Mount Laurel, N.J. Visit his Web page at [//members.aol.com/EdWords/top.html](http://members.aol.com/EdWords/top.html).

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The Next Best Thing To Being There

CONTIGO SOFTWARE LLC, a San Diego-based startup, has created a new Java-based technology called **Itinerary Web Presenter** that allows users (called "pilots") to click through the HTML links on any Web site to simultaneously guide one or more remote users ("passengers") through HTML graphics and data.

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compared with other Internet collaboration products that require all users involved to run the same software.

Itinerary Web Presenter applications will typically be implemented in conjunction with some type of voice connection, such as a phone call or conference call. Integration with digital telephony and videoconferencing is slated for future releases when these technologies become more mature.

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ShopTalk

Bose's Warren Harkness on Life After IS

CIO: If you believe the press, total quality management is passé. Why is it alive and well at Bose?

A lot of companies tried it for a couple of years and said, "This isn't going to work." We believe it is a long-term effort, a philosophy. Bose doesn't do things for the short term; we're persistent in trying something and making it work.

What are your TQ responsibilities?

The line managers are responsible for implementing TQ. My organization's role is to enable that through training and assistance. Sometimes we are advisers; sometimes we're pushers. We help set up improvement teams, train them in TQ tools and methods, and then track and monitor their efforts.

Why would Bose turn to an IS executive to take on that role?

There's a lot of commonality in the traits of a successful CIO and a successful TQ director. Our president was looking for a change agent, a catalyst, which I think comes naturally to a lot of IS people. You need a process orientation because a lot of TQ is process. And you need to understand the business functions. If you're satisfying those groups with information services, you probably understand their priorities



Spotlight On:

Warren Harkness, director of total quality, Bose Corp., Framingham, Mass.

- **Line of Business** Consumer audio electronics.
- **Bio** Was director of information services at Bose for nine years before being promoted to total quality director in 1994; prior to that, was director of information resource management at Boston's Kendall Co.; began professional career as an avionics engineer.
- **Day to Day** Responsible for establishing worldwide total quality capability at Bose, developing a TQ strategy, maintaining the organizational structure to support it and implementing an infrastructure to realize the company's business goals.
- **Challenges** Keeping TQ fresh despite long maturity cycle; developing programs to accommodate business functions with diverse attitudes toward TQ implementation.

and hot buttons and what needs to be done.

How tough was your transition from IS?

It wasn't that big a transition because, since 1990, I'd been attempting to learn and apply TQ in IS. I learned what client requirements were by listening to them, doing satisfaction surveys, trying to build a process model of IS and measuring the process rather than pointing out blame and yelling at people.

What's different about the challenges in IS versus TQ?

I'd compare IS to a tsunami, where TQ is more like Chinese water torture. The challenge in IS is knowing what to change and when to change it. In TQ, the emphasis is on finding the right way to apply the tools you already have. But you have to start with one little improvement team, one process, and then wait for it to spread—drip,

drip, drip—through peer success stories.

What critical skills do CIOs need to make the transition from IS to another business position?

What's worked for me is trying to understand and work with customers, find out their requirements and enable them to solve their problems without being directive about the solution.

It's important to relate to people in their context and convince them that you understand their problems and that the technology is just a means to solve a problem. When I first started getting involved in TQ in IS, it altered people's perception of my just being an IS techie, and [they realized] that I really do understand business process improvement and planning.

Do you miss the IS pace of change and the exciting new technologies?

I miss some of the technology churn. And once in a while, I think about what it might be like working with the Internet and things like that.

But I don't miss the firefighting. Nobody likes to get a call at midnight saying the database blew up. The crises I deal with now are more like a trainer is out sick for a course we're giving that day or a problem-solving team is stuck and doesn't know what to do.

—Richard Pastore



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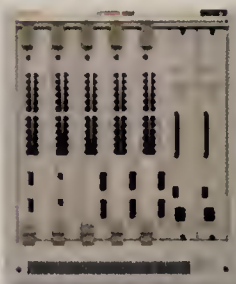
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